BLM LIBRARY
88066370

9433

Oil & Gas Areas considered by this EAR

OR 7424 - Wdn 9-14-77

OR 7412 - Wdn 9-14-77

OR 7413 - Wdn 9-14-77

OR 7435 - Lease eff. 11-1-77
Terminates 11-1-78

Wdn

PROPOSED OIL AND GAS LEASING

ENVIRONMENTAL ANALYSIS RECORD

# ANDERSON VALLEY

# NON-COMPETITIVE

# OIL AND GAS AREA

Burns District
Bureau of Land Management
U. S. Department of Interior

FEB 1977

HD
243
.07
A53
1977

#72153350

ID58066370

HD
243
.07
A53
1977

# PROPOSED OIL AND GAS LEASING

# ENVIRONMENTAL ANALYSIS RECORD

## ANDERSON VALLEY

## NON-COMPETITIVE

## OIL AND GAS AREA

Burns District
Bureau of Land Management
U. S. Department of Interior

FEB 1977

TABLE OF CONTENTS


| | | Page |
|---|---|---|
| I. | Proposed Action | 1 |
| | Introduction | 1 |
| | Operational Procedures | 1 |
| | Administrative Procedures | 11 |
| | Alternatives to the Proposed Action | 16 |
| II. | Existing Environment | 17 |
| | A. Physiography | 17 |
| | B. Geology | 17 |
| | C. Soils | 19 |
| | D. Land Use | 24 |
| | E. Air | 25 |
| | F. Temperature | 25 |
| | G. Non-Ionizing Radiation | 25 |
| | H. Water | 25 |
| | I. Vegetation | 28 |
| | J. Wildlife | 28 |
| | K. Ecological Interrelationships | 33 |
| | Food and Community Relationships | 33 |
| | L. Human Values | 34 |
| | Socio-Cultural Interests | 34 |
| | Archeology | 35 |
| | Social Welfare | 41 |
| | Attitudes and Expectations | 42 |
| III. | Analysis of the Proposed Action | |
| | A. Anticipated Environmental Impacts | 44 |
| | B. Possible Mitigating Measures | 51 |
| | C. Recommended Mitigating Measures | 53 |
| | D. Residual Impacts | 55 |
| IV. | Relationship Between Short-Term Use and Long-Term Productivity | 57 |
| V. | Irreversible and Irretrievable Commitments of Resources | 59 |
| VI. | Persons, Groups and Government Agencies Consulted | 59 |
| VII. | Intensity of Public Interest | 59 |
| VIII. | Participating Staff | 60 |
| XI. | Summary Conclusion | 60 |

Page

FIGURES


1. Oil & Gas Lease Status Map 2
2. Sequence of an Oil and Gas Operation 3
3. Oil and Gas Field 7
4. Sequence of Administration Procedure 13
5. Geologic Map 18
6. Soils 22
7. Wildlife 32


TABLES


1. Average Monthly Temperature 27
2. Average Monthly Precipitation 27
3. Vegetation Species 29


APPENDIX


A. Statewide Overview of Possible Oil and Gas Development on Federal Lands
B. Federal Oil and Gas Regulations
C. Environmental Protection Agency Regulations
D. Oil and Gas Lease Environmental Protection Clause
E. Form for Additional Stipulations After Lease Issuance
F. Oregon Department of Geology and Mineral Industry Regulations
G. State Drilling Permit Conditions
H. Public Interest Section

## DESCRIPTION OF THE PROPOSED ACTION

### Introduction

The proposed action is the leasing of National Resource lands for the rights of exploration and development of oil and gas. The area under lease application is shown in Figure 1. Most of the area under lease application lies north of Anderson Valley and south of Virginia Valley while another area under lease application lies three miles southeast of Anderson Valley Ranch on the upland plateau (Figure 1). The environmental analysis will be restricted to this area totaling 7,528.7 acres (30.4 hectares) as the remainder of the leases (58,478 acres or 2,366.5 hectares) were issued in 1971. Some private lands are under lease and most of the lands owned by the State of Oregon are under lease.

This Environmental Analysis Record (EAR) for the Anderson Valley Oil and Gas Leasing Program will describe the administrative procedures to be followed in a leasing program and the technical aspects of an oil and gas exploration and development operation. The EAR will also describe the setting in which the leasing would occur, assess possible environmental impacts of the proposed action and recommend measures to alleviate these impacts if the leases are issued.

Once all of these factors have been considered, the Bureau of Land Management will decide whether the issuance of the oil and gas leases would result in any significant environmental impacts. If the decision is that the issuance of the leases in the Anderson Valley area will have no significant environmental impact or it is not a major federal action, then positive measures will be recommended to reduce actual or potential adverse impacts. If significant impact seems likely, an Environmental Impact Statement (EIS) will be written. All of the factors would again be considered in the EIS, and a decision will be made whether to issue the leases. If impacts can be significantly reduced by mitigating measures, then the leases can be issued. For an overview of the cumulative effects of oil and gas development on Federal lands in Oregon, refer to Appendix A.

The following is (1) a view of the technical aspects of how an oil and gas field is developed, and (2) a summary of the administrative procedures that involve various Federal and State agencies before, during and after an oil and gas field is developed.

## OIL AND GAS OPERATIONS

Petroleum operations progress through five phases: (1) preliminary investigations; (2) exploratory drilling; (3) development; (4) production and (5) abandonment. The five phases are illustrated in Figure 2.

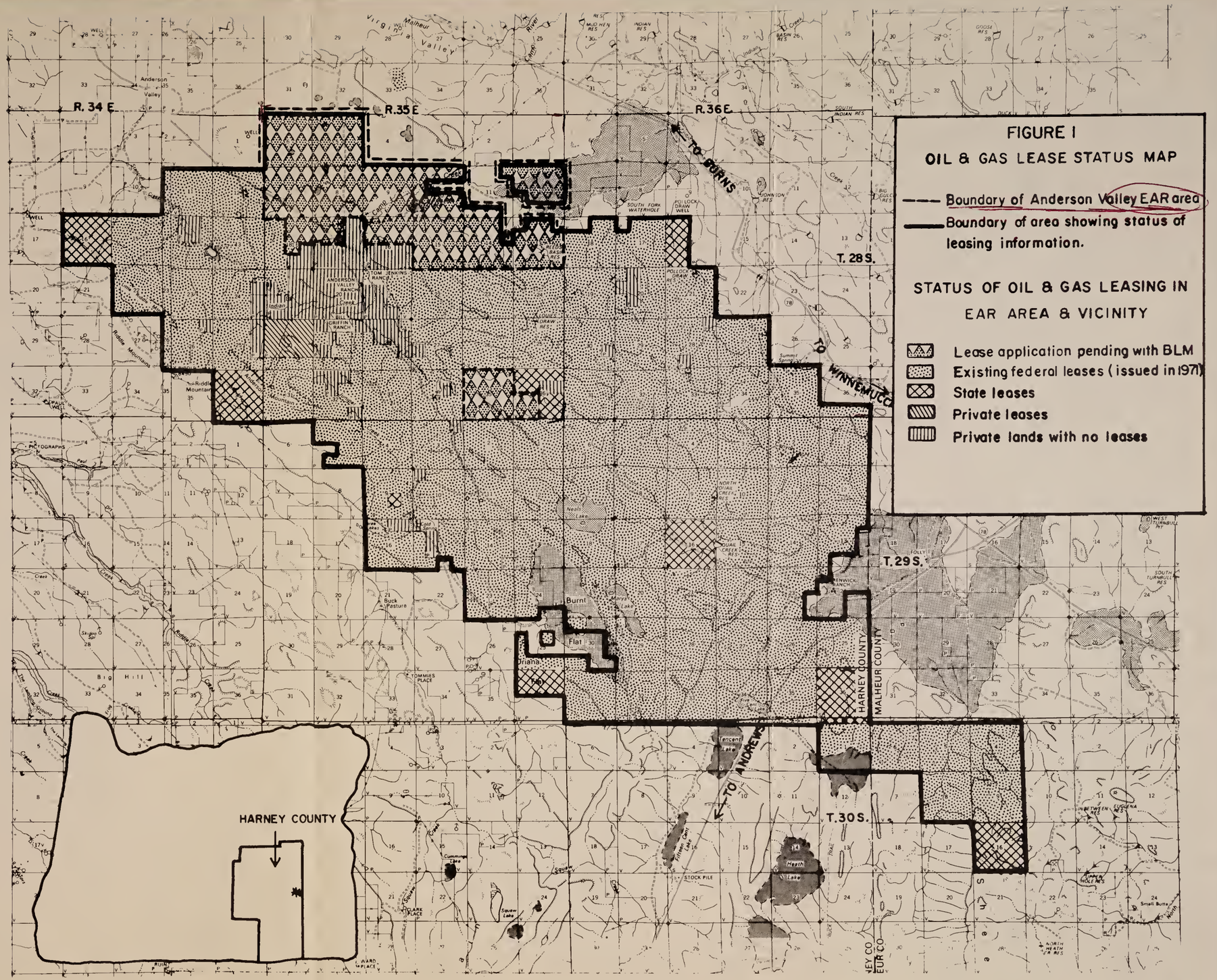



FIGURE 1

OIL & GAS LEASE STATUS MAP

Boundary of Anderson Valley EAR area

Boundary of area showing status of leasing information.

STATUS OF OIL & GAS LEASING IN EAR AREA & VICINITY

- Lease application pending with BLM
- Existing federal leases (issued in 1971)
- State leases
- Private leases
- Private lands with no leases

* LOCATION OF ANDERSON VALLEY OIL & GAS E A R

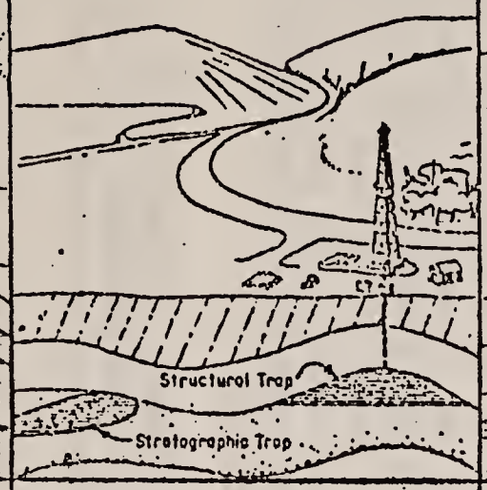
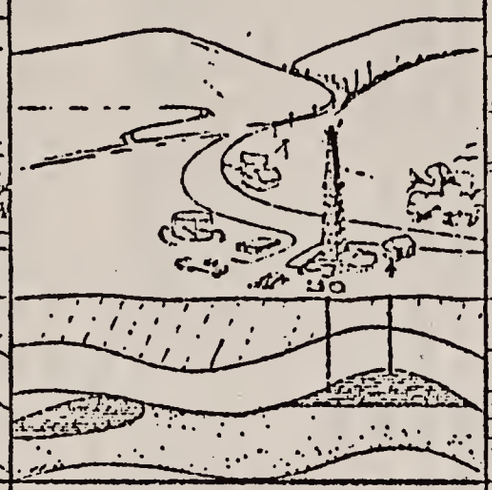
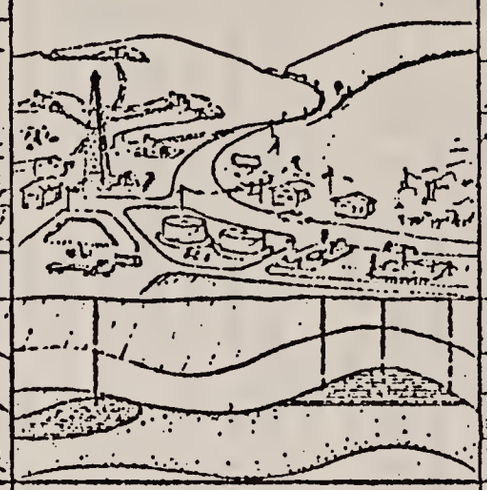
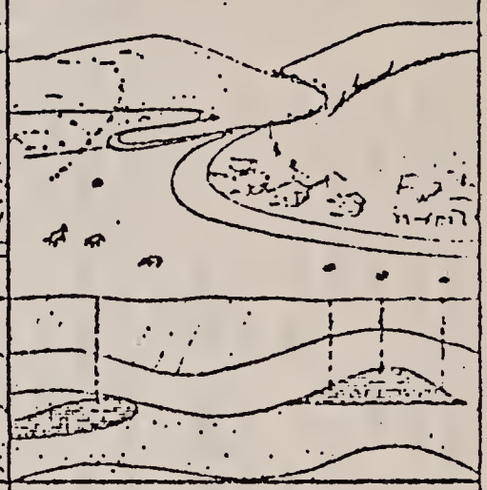
| PHASE I | PHASE II | PHASE III | PHASE IV | PHASE V |
|---|---|---|---|---|
| RELIMINARY INVESTIGATON<br>Unknown Geologic Structure)<br>reliminary investigations are carried out over<br>rge areas from aircraft and on the ground. | EXPLORATON<br>If the preliminary investigations indicate that geologic structures may contain oil and gas, a lease is obtained and an exploratory well is drilled. | DEVELOPMENT<br>If oil and gas are discovered during the exploration phase and recovery is economically feasible, the field is developed for production. | PRODUCTION<br>The production phase involves operation and maintenance of the field and recovery of oil and gas. | ABANDONMENT<br>When the field is abandoned, equipment is removed, wells are plugged, and the surface is reclaimed. |
|  |  |  |  |  |
| rcome surveys<br>rface surveys<br>Geochemical surveys<br>Stratigraphic & Other Mapping<br>Geophysical surveys<br>Explosive method<br>Thumper method<br>Vibrator method<br>Gravity & other methods<br>Geologic surveys | Wildcat well drilling<br>Access roads<br>Camp and buildings (remote areas) | Development drilling<br>Access roads<br>Pipelines<br>Utility lines<br>Separators<br>Storage tanks<br>Camp and buildings | Continued drilling and development of field<br>Pressure maintenance system<br>Disposal of waste<br>Secondary and tertiary recovery system<br>Communication and production systems<br>Communities | Equipment, buildings and facilities removal<br>Field cleanup<br>Well abandonment and plugging<br>Eliminate Hazard<br>Surface reclamation<br>Landscaping<br>Reseeding<br>Other erosion control |

Figure 2. Sequence of operation in an oil and gas field.

SEQUENCE OF OPERATIONS IN AN OIL AND GAS FIELD

Standard Oil, current applicant for leases in the area, has already conducted a preliminary investigation. They plan to drill an exploratory wildcat well which could lead to a discovery of an oil and gas field. This section is a description of the operations of an oil and gas field that can be expected in the lease area.

## Preliminary Investigations

Preliminary investigations, which often precedes the issuance of a lease, begins with an office review by the company of geological and technical data available for the region. In many oil and gas producing regions, an office analysis may develop enough information to proceed with drilling without investigations. However, the office analysis may indicate only a broad prospective area, and further preliminary investigations may be required.

Preliminary investigations are made from the air and on the ground. Small aircraft and helicopters are used to conduct visual reconnaissance, photographic and geophysical surveys. On the ground surveys may involve either casual or intensive use of the land. Casual uses generally do not disturb the surface; intensive uses include operations that require clearing of new access trails, movement of heavy equipment, or other actions that can result in substantial surface disturbance. Geological, geochemical and soil-gas surveys normally do not disturb the surface. Seismic surveys, one of the most frequently used methods of geophysical investigation, often requires clearing new access trails and moving heavy equipment.

In seismic surveys, a shock wave is sent into the subsurface and the time required for the wave to travel to and return from a subsurface horizon is recorded. A map of the subsurface can be drawn from an analysis of the differences in the times it takes the wave to be reflected back to the surface.

Explosive, thumper or vibrator methods are used to produce the shock wave. In the explosive method, shot holes are drilled to a depth of 50 to 200 feet (15 to 60 meters). Four to twelve holes are drilled per mile. The holes are loaded with 5 to 50 pounds (2.2 to 22.7 Kg) of explosives and detonated. The same hole may be reloaded and shot several times to find the depth and explosive charge returning the best reflection or refraction signal.

The thumper and vibrator methods pound or vibrate the earth to create a shock wave. Less than 50 square feet (465 $dm^2$) of surface area is required to operate the equipment at each test site.

The sensors and energy source are located along straight seismic lines laid out on a 1- to 2-mile grid (1.6 to 3.2 km). Existing road systems are used where available. Lines may be cleared of vegetation and loose rocks to improve access for the trucks. Each mile of line cleared to a width of 8-1/4 feet (2.47 m) utilizes one acre (0.4 hectare) of land.

If the preliminary investigations warrant further exploration, the operator (in this case Standard Oil) will apply for a lease and prepare for the next phase.

Exploratory Drilling

If preliminary investigations warrant further explorations, the operator may drill shallow stratigraphic test holes to locate geological indicators of oil and gas. The holes are usually drilled with truck-mounted equipment and disturb a relatively small area, although heavier drilling equipment may be used for deeper holes. Stratigraphic holes in areas of high pressure zones are cased. The roads and trails needed for access to the test sites are temporary and involve minimal construction. The drill site occupies approximately 900 square feet (8,361 $dm^2$) and is sometimes placed in the center of a new or existing trail. The presence of suspected oil and gas deposits may be confirmed by wildcat drilling of deep holes. Wildcat wells are deeper tests, require larger drilling rigs and support facilities and may disturb a larger surface area, generally one to three acres, (0.4 to 1.2 hectares), than stratigraphic tests. Required facilities include roads, drill pads, mud pits and in some isolated areas, camps and airports. Twenty to twenty-five men are needed for this type of operation.

Nationwide, approximately one out of every 7 wildcat wells in 1974 was completed as a producer. However, only one in 59 resulted in discovering significant amounts of oil and gas. A significant amount is considered to be 1 million barrels of oil and 6 billion cubic feet of gas. Of the 200 or so wells drilled in Oregon, none has been financially successful.

After a drilling site has been selected, a heavy duty road may be built to move the drilling rig and other equipment to the location. The roads are not designed for permanent access.

The well site occupies about an acre (0.4 hectare) and is cleared of all vegetation and graded nearly flat. Depending on the soils in the area, the well site, drill pad and roads may or may not be gravelled. The drilling rig, mud pumps, mud pit, generators, pipe rack and tool house are located on the drill pad. Other facilities such as storage tanks for water and fuel may be located on or nearby the drill pad. Mud pits are lined with impermeable material to prevent contamination of soils or water.

A water supply is needed for mixing drilling mud, cleaning equipment, cooling engines and other uses. A pipeline may be laid several miles to a stream or water well to provide the 800 gallons (3,028 liters) which are needed daily.

The drilling mud is maintained at a specific weight and viscosity to cool the bit, reduce the drag of the drill pipe on the sides of the well bore, bring the drill cuttings to the surface for disposal, seal off any porous formation so as to prevent loss of drilling fluid, and protect formation fluids from contamination. Additives help keep the drill mud

at the appropriate viscosity and weight. Some of the more rarely used additives are caustic, toxic or acidic in nature. Weight additives and fluid loss additives are commonly used and harmless.

Completing the well requires installation of steel casing between the surface casing and the pay zone. The casing is cemented in places to provide stability and to protect specific zones such as fresh water aquifers. The drilling rig and most of the support equipment are usually removed from the well site after the casing is cemented.

An operator may also need storage tanks to hold oil produced from an exploratory well and a separator to separate this oil and gas. If water is produced with the oil, a treatment plant may be needed. The gas separated from the oil may be burned off as waste during the initial stage of development of an oil field.

If gas is discovered, the operator is allowed to flare only enough gas for a short period of time to determine the well's capabilities. The well is then shut in until a gas line is constructed.

The completion of a wildcat well as a commercial producer usually marks the beginning of the development phase.

Development

A well spacing pattern must be established before development drilling begins. The pattern is determined by the U. S. Geological Survey and the Oregon Department of Geology and Mineral Industries. Most spacing patterns established for current Federal leases set minimums of 10 to 160 acres (4 to 64 hectares) per well for oil production and units of 160, 320, or 640 acres (64, 128, 256 hectares) per well for gas production. Administrative rules of the Oregon Department of Geology and Mineral Industries require a minimum spacing pattern of 40 acres per well, unless a different spacing pattern is approved by the Department's governing board.

The procedures used in drilling development wells are about the same as those used for a wildcat well, except that there usually is less subsurface sampling, testing and evaluation.

Facilities required for development drilling may include access roads, well sites, flowlines, storage tank batteries, facilities to separate oil, gas and water, and injection wells for salt water disposal. In remote locations, camps and air strips may be required.

Access roads usually are better planned, located and constructed than those built for wildcat wells and must be approved by the Geological Survey in cooperation with BLM. When an oil field is developed on a spacing pattern of 40 acres (16 hectares) per well, the wells are one fourth of a mile from each other. If a section (1 square mile) is developed with 16 wells, at least 4 miles (6.4 km) of access roads are built and 4 to 6 miles (6.4 to 9.6 km) of flowlines are installed between the wells and the tank batteries.

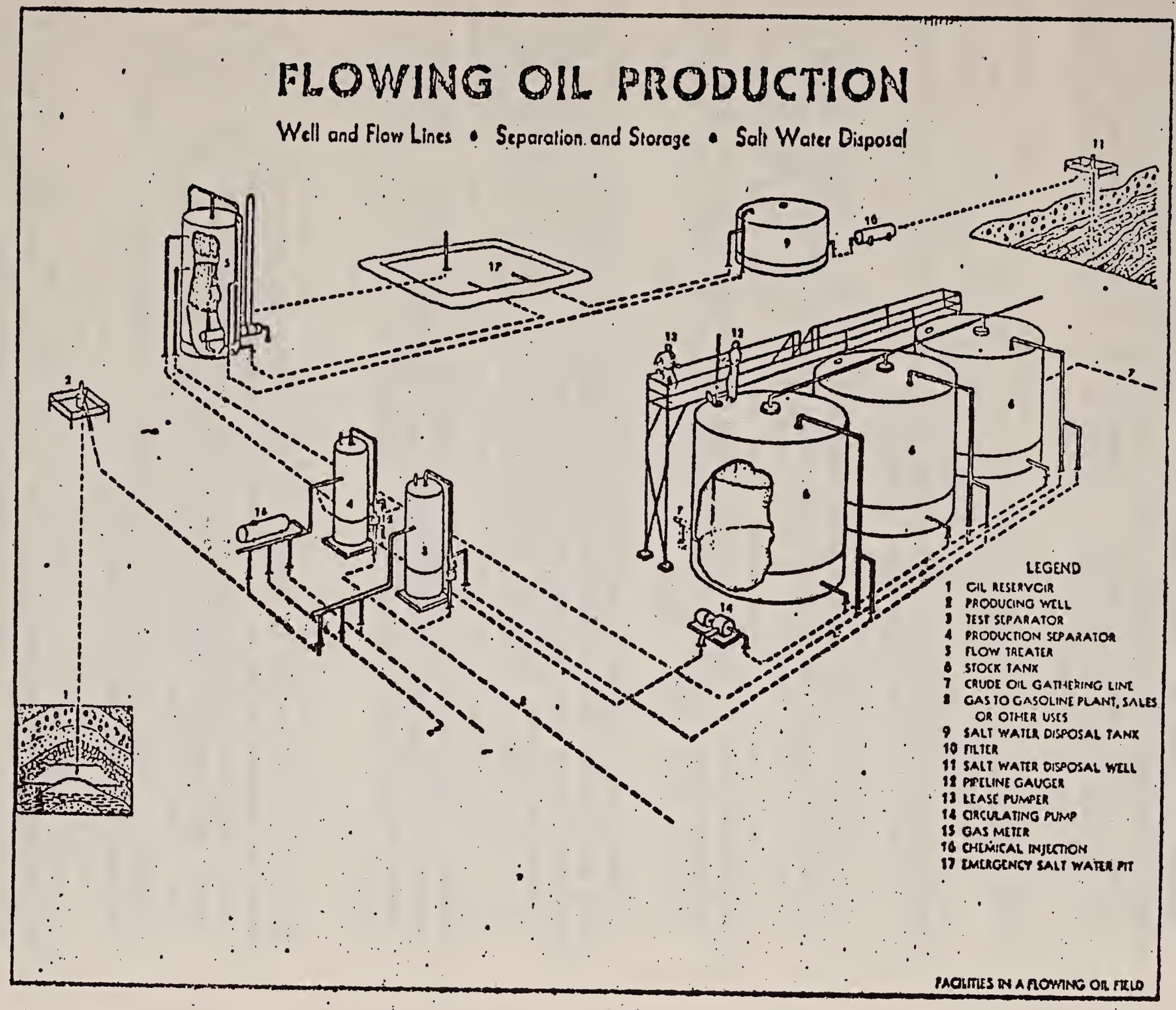

FLOWING OIL PRODUCTION
Well and Flow Lines • Separation and Storage • Salt Water Disposal
LEGEND
1 OIL RESERVOIR
2 PRODUCING WELL
3 TEST SEPARATOR
4 PRODUCTION SEPARATOR
5 FLOW TREATER
6 STOCK TANK
7 CRUDE OIL GATHERING LINE
8 GAS TO GASOLINE PLANT, SALES OR OTHER USES
9 SALT WATER DISPOSAL TANK
10 FILTER
11 SALT WATER DISPOSAL WELL
12 PIPELINE GAUGER
13 LEASE PUMPER
14 CIRCULATING PUMP
15 GAS METER
16 CHEMICAL INJECTION
17 EMERGENCY SALT WATER PIT
FACILITIES IN A FLOWING OIL FIELD

Figure 3. Facilities in a flowing oil field.

Surface uses in a gas field will be significantly less than in an oil field because gas wells usually are drilled on 160 acres (64 hectares) per well or larger spacing units. A 160 acre (64 hectare) per well spacing pattern allows no more than four wells per section and requires 2 miles (3.2 km) of access roads and pipelines. Separation and storage facilities are not required for gas production unless the production is rich in liquids or condensate. It may be sold without separation and the purchaser may separate the liquids at a central processing point far removed from the lease.

Production

Figure 3 illustrates an oil and gas field facilty once a field is developed for production. The components and methods of production will be discussed in the following paragraphs.

If the pressure in the petroleum reservoir is great enough to force the oil to the surface by itself, the result is a flowing well. The surface equipment at the head of a flowing well is usually limited to a series of valves known as a "Christmas tree" and a fenced area 15 by 15 to 50 by 50 feet (4.5 by 4.5 to 15 by 15 meters) around the well head and Christmas tree. This is a minimum of surface equipment and produces little or no sound.

However, most oil wells in the United States are not free flowing wells, thus must use some means of artificial lift to bring the oil to the surface. More than 90 percent of the nation's oil wells (1971 figures) were on artificial lift and most of the artificial lift wells used sucker rod pumps. These create some noise because of mechanical equipment. Other types of artificial lifts are hydraulic and centrifugal pumps. Some of the equipment is installed on the surface and requires either fuel or electric power lines. All generate noise, ranging from almost none for electric motors to high noise levels for single gas engines.

Injecting high pressure natural gas can also help bring petroleum to the surface. This method is used only when low cost natural gas is available and where pressure in the petroleum reservoir is sufficient to force the hydrocarbons part of the way up the well. The addition of gas lowers the specific gravity of the petroleum so that it completes its flow to the surface. This system is quiet and uses little surface. However, it will be used less frequently in the future as supplies of high pressure natural gas decline.

No pumping is needed in a well that produces natural gas; the pressure in the formation brings the gas to the surface. However, it may also bring water with it that can choke off the gas flow. In that case, a pump may be installed to remove the column of water. The surface use for a gas well is limited to a 20 by 20 foot or 6 by 6 meter area.

Several techniques have been developed to increase the recovery of petroleum when forces within the reservoir are insufficient to drive the petroleum to the well bore. These new methods are called secondary production or recovery methods. Gas or liquid is injected into the formation(s) in order to supplement the natural forces and drive the oil and gas that remains in the reservoir to the well where it can be recovered.

The most common form of secondary recovery is injecting water into the reservoir to force additional oil to the production well. This "water flooding" can increase recovery by approximately 100 percent.

Other secondary techniques for improving oil recovery have been tested, including miscible flooding (injecting chemical solutions into the reservoir), fire flooding (starting a controlled fire in the reservoir) and steam flooding (injecting steam in the reservoir). Tertiary recovery methods are any of the previously mentioned techniques after water flooding has been tried.

Some of the gaseous components may condense into liquid form and reduce the flow of the gas. To prevent this, additional gas is injected to maintain pressure above the condensation point for gas.

Once the oil and gas is brought to the surface, it is distributed by flowlines to a central collection point before it is transported directly off the lease area. The flowlines are usually 3 or 4 inches (7.6 or 10 cm) diameter steel pipes. They may be buried, installed on the surface or elevated.

An exception is natural gas, which is often sold at the well head and transported directly off the lease. If liquid hydrocarbons or water must be removed first, the gas may be transferred to a central collection point prior to sale.

The crude oil is stored in one or more steel tanks, which are usually located on or near the lease. (See Figure 3). Small leases may contain only one tank battery; large leases may contain several, with each battery including separating, treating and storage facilities.

If the fluids produced at the well contain gas and water, oil and gas and water are separated before the oil is stored in the tank battery. Most of the water produced with oil and gas is brackish to lightly saline, although some water is fresh enough for beneficial use. Ranchers and farmers in some areas have filed prior rights claims on oilfield water so they can use it for agricultural purposes.

The saline water is disposed of by either subsurface injection as shown in Figure 4 or by evaporation pits. The latter method is the more likely in eastern Oregon because of the arid climate and high evaporation rate. When salt water is disposed of underground, it is usually introduced into a subsurface horizon containing water of equal or

poorer quality. These disposal wells are cased to protect fresh water aquifers from contamination.

Land requirements for oil field facilities range from 22.4 acres (9 hectares) per square mile (square km) to 2.4 acres (1 hectare) per square mile (2.56 sq. km) depending upon the well spacing pattern. Less land is used in gas fields because gas production usually does not require storage on the lease.

The number of people required to operate an oil or gas field varies with the characteristics of the production and the number of lease holders in the field. One employee in a large modern field can control production of about 25 wells if they flow without pumping. When wells are pumped, one employee in a large modern field can control production on 10 to 20 wells. If storage tanks are manually qauged and sampled, one person can service about 25 tanks. If automatic gauging and sampling devices have been installed, one employee can service 100 to 150 tanks. In a large field, one five man maintenance crew can service up to 50 wells.

Abandonment

The abandonment operations, like all the previous activities, are monitored by the Geological Survey and Oregon Department of Geology and Mineral Industries. Both dry wildcat wells and development wells are normally plugged before the drilling rig is removed since the operator can use the drilling rig to plug the hole and avoid bringing in other equipment. Once the drilling rig is removed, the surface and any reserve mud pit is restored to its original condition as much as possible.

When the operator wishes to abandon a producing well, he must demonstrate its unsuitability for further profitable production to the Geological Survey district engineer. In some cases, wells are plugged (with cement) as soon as they are depleted. Sometimes depleted wells are not plugged immediately, but are allowed to stand idle for possible better use in a secondary recovery program.

When an oil or gas field is depleted and the entire lease will be abandoned, all surface equipment is removed. Flowlines and injection lines that had been buried are usually left in place. The operator's bond with the federal government is not terminated until BLM has approved surface restorations, the Geological Survey has approved subsequent reports of abandonment, and royalties due the federal government have been received.

## ADMINISTRATIVE PROCEDURES

Before we discuss what administrative procedures are involved, it is necessary to examine roles that the Bureau of Land Management and the U.S. Geological Survey have in an oil and gas leasing program.

The Bureau of Land Management administers federal laws and regulations pertaining to mineral resources on lands under its primary jurisdiction (i.e., national resource lands) and those withdrawn for other agencies, and on private lands when the government owns the subsurface mineral rights. BLM, in consultation with the U.S. Geological Survey, and any other federal agency with surface management jurisdiction over lands in the area, determines whether and under what conditions federal oil and gas leases will be issued.

After the lease is issued on lands administered by BLM, the Geological Survey oversees the oil and gas activities in the "area of operations" (see following section on "Post-Lease Procedures" for a definition of "area of operations"). They are responsible for maintaining and providing engineering, geological, geophysical, economic and other technical expertise to assure compliance with applicable laws, regulations and Interior Department objectives. They also ensure that the operator complies with any surface stipulations that the BLM has written into the lease. For a comprehensive view of the administrative procedures involved in an oil and gas leasing program, see Figure 4.

### Pre-Lease

The first step in oil and gas exploration is conducting a geophysical survey over an area favorable for oil and gas. If an operator wants to survey BLM administered lands that he has not leased for oil and gas, he must file a Notice of Intent and a bond with the BLM before entering the land. When he signs the Notice of Intent, the operator agrees to conduct the exploration according to BLM terms and conditions, which are designed to minimize any potential adverse impacts. Upon completion of the survey, if the operator has complied with all of the stipulations, he will be released from the bond.

If the results of the geophysical survey are favorable, the operator will apply for an oil and gas lease. Many times, in order to protect the prospect from competitive speculation, the operator applies for more acreage than is needed to develop the resource. Once the application is received, then BLM land use planning process goes into effect.

BLM's land use planning process constrains and guides oil and gas leasing on national resource lands. Oil and gas production is one of many possible land uses considered in the Bureau's planning system. Once the existing resources have been inventoried in the Unit Resource Analysis and after the public has had an opportunity to contribute ideas and suggestions on how the land should be managed, BLM develops a

Management Framework Plan, which indicates how land uses in the planning area will be coordinated and identifies constraints and parameters for future activities in the area. Management Framework Plans have been prepared for all areas prospectively valuable for oil and gas in eastern Oregon. Since land use planning is a dynamic process, the Management Framework Plans are revised and updated as the need arises.

Once land use plans have been developed, BLM prepares an Environmental Analysis Record (EAR) on the oil and gas lease application area. The Environmental Analysis Record describes the setting in which the action is to occur, possible environmental impacts of the proposed action and recommend measures that would reduce adverse impacts of the proposed action.

BLM then uses information gathered in the land use planning and environmental analysis processes to determine whether oil and gas leases will be issued for specific lands and, if so, the special conditions to which the prospective lessees must first agree.

Most of the special stipulations in recent oil and gas leases relate to the prevention or mitigation of unfavorable environmental impacts.

All oil and gas leases now issued by BLM contain an open ended set of stipulations. These stipulations ensure that after the lease is issued, BLM will have additional opportunities to specify measures the lessee must take to protect environmental values.

Oil and gas leases may also contain site specific stipulations. These stipulations are developed individually for each lease area as a result of identified impacts on the specific resources affected within the area.

Before a lease is issued, the Geological Survey prepares a classification report to determine whether the lease will be issued on a competitive or noncompetitive basis. Competitive leases are issued within known geologic structures (KGS's) and noncompetitive leases are issued outside KGS's.

No known geologic structures have been identified in Oregon. An area is classified as being within a known geologic structure if it is within the trap of a producing oil and gas field as best as can be determined from the geological data available at the time. If the area is in a KGS, it is not available for leasing until it is offered at a competitive lease sale.

Lease Issuance

If all the above factors qualify an area, a lease is issued on a noncompetitive basis to the first qualified applicant if the land is legally available and if USGS determines that it is not in a KGS. Noncompetitive leases are currently issued for a primary term of 10 years.

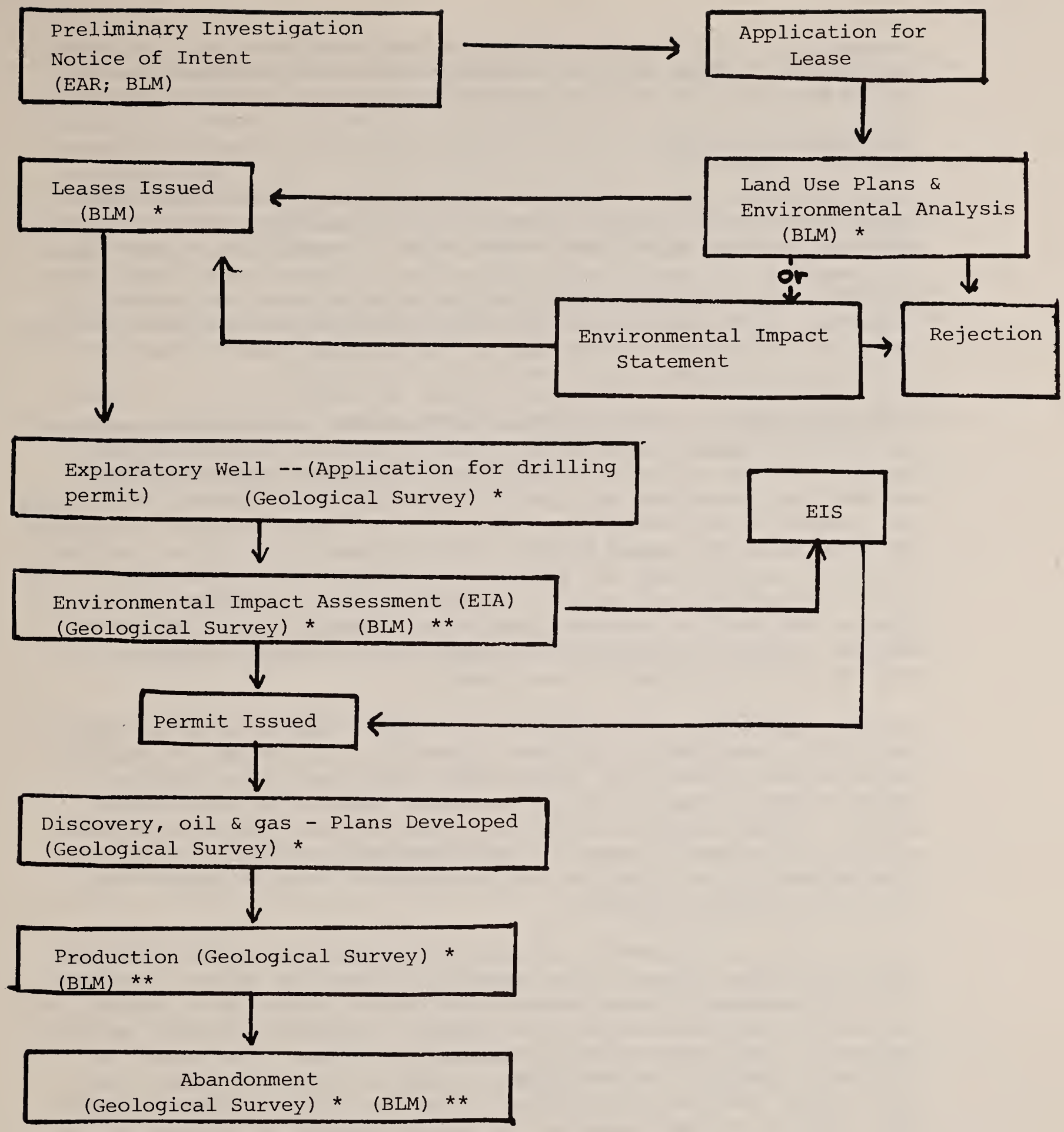



FIGURE 4. Administrative Procedures
in an Oil and Gas Leasing Program

* primary responsibility
** secondary or advisory responsibility

Lessees must furnish bonds conditioned upon compliance with the lease stipulations. Bonds must be furnished before a competitive lease is issued and before a drilling permit is issued on a noncompetitive lease.

Post Lease Procedures

During the term of the lease, the Geological Survey supervises operations of the lessee in that portion of the lease tract within the area that has been legally defined as the "area of operations." Each "area of operations" is specifically defined in the lessee's drilling permit application and generally refers to the area of direct exploratory activity. BLM recommends surface protection and rehabilitation measures before the Geological Survey acts on the drilling permit. BLM supervises the activities outside the area of operations.

The "open ended" lease stipulation requires the lessee, before entering the land, to submit for approval to the Geological Survey a map and surface use plan explaining the nature of the anticipated activity, surface disturbance and appropriate rehabilitation measures. The lessee also submits this information to BLM. If the lessee proposes to conduct any activities that would disturb the environment, he will be required to obtain approval from the Survey at least once during the life of the lease. If he finds oil or gas and wishes to drill additional wells to develop the field or construct facilities needed to reach full production, he will be required to return to the Survey for approval of plans for each new stage of development.

For all exploratory well proposals, the USGS prepares an environmental analysis in consultation with BLM (Figure 4). If the BLM so requests, the Geological Survey will hold a joint field inspection with the operator, BLM to analyze the environmental impacts of the proposed action. Stipulations are attached to the drilling permit to minimize adverse environmental impacts. The lessee may be asked to change the proposed well site if drilling in the original location would have severe environmental impacts.

If oil or gas is discovered, lessees are required to submit additional lease development plans to the Geological Survey for approval (Figure 4). The Geological Survey ensures that proper construction methods are followed in the lease and drilling permits. Stipulations must meet the approval of the other resource management agencies. The lessee is required to prepare for contingencies such as fires, accidents, blowouts, spills and leaks, and to notify various State and Federal agencies, such as the Environmental Protection Agency, in the event of an oil leak or spill.

The Environmental Protection Agency (EPA) regulates and identifies procedures, methods and equipment to be used to prevent the discharge of oil from nontransportation related onshore and offshore facilities into navigable water. These regulations apply to owners and operators engaged in drilling, producing or gathering oil and gas. Oil and gas operators must file a spill prevention control and counter-measure plan with the EPA.

Such an operation must meet not only Federal but State requirements. In Oregon, the State Department of Geology and Mineral Industries (DOGAMI) requries a permit for any drilling operation. The agency must also approve casing and cementing programs designed to prevent leakage of contaminating fluids, inspect blowout prevention equipment, witness abandonment plugging and collect well records. In the event of a discovery, the Department's rules require uniform development, location and spacing of wells and regular reporting of storage and production.

The State Department of Environmental Quality (DEQ) may add conditions to the state drilling permit that enforce compliance with state air and water quality laws.

Before a drilling permit is issued, the application is reviewed by the Oregon Department of Environmental Quality (DEQ), the Water Resources Department, the Department of Fish and Wildlife and the Department of Land Conservation and Development (LCDC).

## ALTERNATIVES TO THE PROPOSED ACTION

The alternative to the proposed action is not to lease any of the federal tracts under application. No description of this alternative is needed since the use of the area will remain the same as present.

However, Oregon does not now contribute any fossil fuels to its continuing petroleum needs. These materials must be brought into the state at a considerable cost to the suppliers and consumers. Since past drilling in the state has indicated the presence of oil and gas, federal leasing could lead to commercial discoveries, which could reduce the importation of the 36 million barrels of petroleum that are consumed in Oregon each year (1972 figures).

# DESCRIPTION OF THE EXISTING ENVIRONMENT

## Physiography

Flat valley lands, low rolling hills, and steeply sloped uplands are the three types of topography present in the area. The elevation ranges from 4300 to 5200 feet (1036 to 1615 m.). Several playas occupy the flat valley bottoms, otherwise, grasses and shrubs are the dominant feature of this terrain. The low rolling hills, for the most part, is a gradation zone from the flat valley floor to the steeply sloped uplands.

## Geology

The lease area lies in the High Lava Plains Province, an uplifted region of young volcanic rocks with minor amounts of sedimentary rocks (Figure 5). The dominant feature of the province is the west to northwest trending zone of en echelon normal faults known as the Brothers fault zone. Many of the eruptive centers for volcanic rocks are concentrated in this zone of faults.

Much of the volcanic activity that produced the present landform began 25 million years ago in the Miocene age. Large volumes of rhyodacite, andesite, and basalt were erupted onto an erosional surface of older sedimentary rocks, now covered by the volcanic rocks.

The volcanic activity continued for a long period of time and was accompanied by an uplifting of the area. This period of uplift and mountain building in time produced the fault-block mountains and table-top mesas. Lakes were forming between these mountains during this period, but later as the Cascades rose and created a more drier climate, the lakes gradually evaporated, the remnants of which are the playas we see today. But after million years of volcanic activity, the magma was exhausted and a quiescent period began. The magma chamber from which the magma had flowed was evacuated and collapsed, thus forming the Harney Basin.

Following the quiescent period, the area again became volcanically active. The faults were the conduits which brought the magma to the surface. The basaltic material formed vents and filled in parts of the lower valleys. Today, the area is in a quiescent period with its accompanying erosion and deposition.

### Oil and Gas Potential

All of the analysis area has been classified by the U. S. Geological Survey as valuable prospectively for oil and gas. The reason for the oil and gas potential is the older (Paleozoic-Mesozoic) sedimentary rocks that may underlie the Tertiary volcanic rocks. To the north of the High Lava Plains, these sedimentary rocks are exposed at the surface in the Blue Mountains and presumably underlie the volcanic rocks in the lease area. These older sedimentary rocks were deposited under marine conditions which is conducive to the formation of oil and gas. Exploratory drilling will have to drill through the volcanic rocks in order to reach the sedimentary rocks.

# FIGURE 5

## GEOLOGIC MAP

Geologic Legend

**Quarternary**

**Pleistocene Holocene**

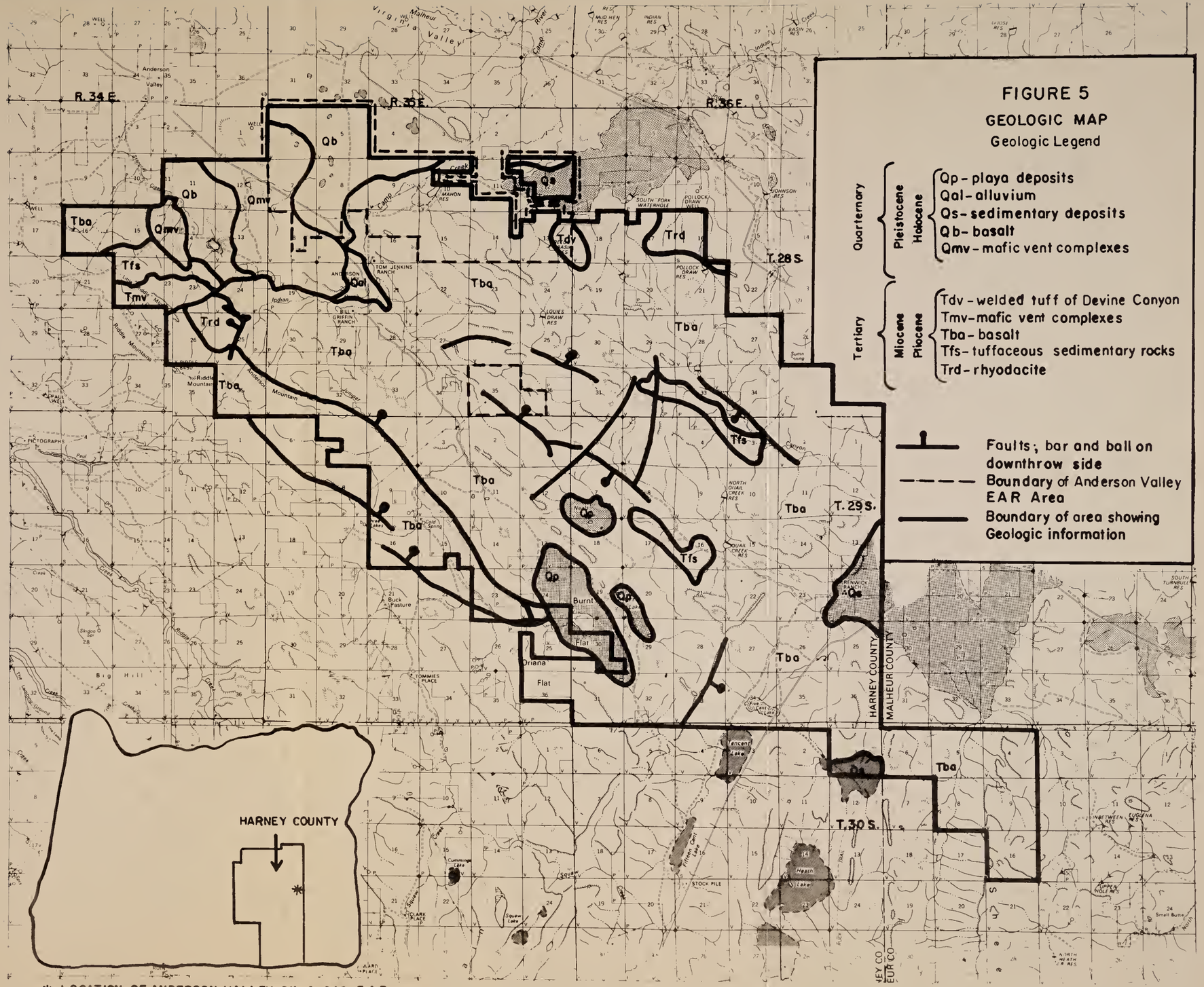
- Qp - playa deposits
- Qal - alluvium
- Qs - sedimentary deposits
- Qb - basalt
- Qmv - mafic vent complexes

**Tertiary**

**Miocene Pliocene**

- Tdv - welded tuff of Devine Canyon
- Tmv - mafic vent complexes
- Tba - basalt
- Tfs - tuffaceous sedimentary rocks
- Trd - rhyodacite

- Faults; bar and ball on downthrow side
- Boundary of Anderson Valley EAR Area
- Boundary of area showing Geologic information




* LOCATION OF ANDERSON VALLEY OIL & GAS EAR

## Geologic Hazards

Geologic hazards present in the lease area include land subsidence, earthquakes, floods, and volcanic activity. Although these hazards are present, the probability of their occurrence is small.

Withdrawal of large amounts of fluids from underground formations will cause a collapse of the upper surface. This land subsidence can cause structural damage. The subsidence can be avoided by reinjecting fluids to compensate for the loss.

Because of the high runoff rate, shallow soils and low infiltration rate, flooding may occur in certain areas. Constriction of stream channels by debris, landfills, and structures can increase the effects of flooding.

Southeast Oregon has a low incidence of earthquake activity. Those earthquakes which have been recorded have caused only minor damage such as cracked walls, masonry, and windows. No earthquake epicenters have been recorded within the analysis area and no active faults have been identified within the boundaries of this environmental analysis or the lease area.

Although volcanic activity was prevalent in the geologic past, no activity has been recorded in recent history. There are no indications of volcanic activity, but since the area lies in a volcanic area, the probability of occurrence cannot be dismissed. The most destructive effects of a volcanic eruption is the associated earthquakes and deposition of volcanic ash.

## Selected References

Mineral and Water Resources of Oregon, 1969, Bull 64, State of Oregon Dept. of Geology and Mineral Industries

Newton, V. C., 1976, An assessment of Oil and Gas Leasing in the Prineville and Burns BLM districts. Unpublished

Greene, R. C., Walker, G. W., and Corcoran, R. E., 1972, Geologic Map of the Burns Quadrangle: U.S.G.S. Misc. Geologic Investigation Map I-680

## Soils

### Darker Soils of Higher Elevations

About 33% of the proposed lease area is covered by shallow to very shallow, well drained soils over basalt, rhyolite, and welded tuff (Mapping Unit 83 and 84). These occur on gently undulating to rolling lava plateaus with some very steep, faulted and dissected terrain. Permeability is moderately slow and runoff is slow. Both actual erosion and erosion hazard are low.

A typical profile has a 3 to 7 inch surface layer of dark grayish brown, very stony silt loam, which is neutral in reaction and friable. This is underlain by a 7 to 16 inch thick grayish brown, stony silty clay or silty clay loam that is firm when moist and neutral in reaction for unit 83 soils. Unit 84 soil has a two to six inch grayish brown stony, gravelly loam horizon, which is friable when moist and neutral in reaction. The substratum is basalt bedrock with calcium carbonate coatings for unit 83 soil while unit 84 soil has a welded rhyolite tuff substratum.

These soils occur at elevations mostly above 6,000 feet, but may be found as low as 5,500 feet on north slopes. Average annual precipitation is from 11 to 18 inches, and mean annual air temperature is 42° F. The average growing season is from 40 to 90 days with frost a possibility in any month of the year. Native vegetation consists mostly of Idaho fescue, bluebunch wheatgrass, Sandberg's bluegrass, low sagebrush, big sagebrush, and bitterbrush and juniper.

Steep Rock Land

Approximately 27% of the analysis area is steep rock land (Miscellaneous Land Type #96). Rough, steeply sloping terrain with shallow, very stony soils interspersed with rock outcroppings are included in this land unit. Steep rock land occurs mainly as canyons and escarpments along margins and dissected portions of lava plateaus.

Light Colored Soils Over Hard Bedrock

About 25% of the analysis area is covered by shallow, extremely stony, well drained soils over basalt, rhyolite, or welded tuff (Mapping Unit 76 & S76). They occur on gently undulating to steep lava plateaus. The permeability is slow and runoff is rapid. Erosion hazard is slight but may be moderate in localized areas.

A typical profile has a surface horizon of a 4 inch layer of light grayish brown, extremely stony loam, which is neutral in reaction. This layer is underlain by a one to 3 inch thick, light brownish gray, extremely stony clay loam that is friable when moist and neutral in reaction. The substratum is a 4 to 9 inch layer of yellowish brown, extremely stony clay that is firm when moist and neutral in reaction. Fractured bedrock coated with silica and lime occurs at 11+ inches below the surface. The surface layer may be somewhat darker at high elevations and on north slopes. A discontinuous hardpan of silica and lime lies over the bedrock in some areas.

Because temperature, elevation, and vegetation factors are critical in soil development, they will be included with each soil type description. Soils in MU #76 and S76 occur at elevations mostly above 6,000 feet, but may range as low as 5,000 feet on north slopes. Native vegetation on these soils includes low sagebrush, Idaho fescue, bluebunch wheatgrass, Sandberg's bluegrass, and juniper. Average annual precipitation is 11 to 15 inches, and the mean air temperature is 42° F. Frost free period averages 40 to 90 days.

Bare Lava Rock

Approximately 13% of the analysis area is covered by recent lava flows. These flows are generally on gentle slopes and have extremely rough and irregular surfaces. The flow areas vary from continuous bare lava rock in the young flows, to older flows that have soil in pockets and smooth areas interspersed with low ridges of bare lava rock. The lava rock unit occurs as a secondary component of unit 76 soil.

Nearly Level Soils of Stream Bottoms

The remaining 2% of the analysis area is covered by deep, well drained soils of recent alluvium occurring on nearly level fans and bottomlands (Mapping Unit 1). Moderate permeability and slow runoff characterize these soils. Unit 1 soils have a low erosion hazard.

A representative profile has a 6 to 20 inch thick surface horizon of light brownish gray silt loam that is friable and has neutral reaction. This layer is underlain by a 10 to 30 inch thick light grayish brown silt loam that is also friable with neutral reaction. The substratum is a grayish brown stratified very fine sandy loam and silt loam that is friable and mildly to moderately alkaline. There may be some layers of fine gravel due to alluvial stratification.

These soils typically are found from 2,500 to 4,700 feet elevation. Native vegetation includes mostly giant wild ryegrass, bluebunch wheatgrass, and big sagebrush. Average annual precipitation is from 8 to 11 inches, and the mean air temperature centers around 47°F. Frost free period is from 75 to 130 days.

Reference

Oregon State University and Soil Conservation Service, 1969, Oregon's Long Range Requirements for Water: State Water Resources Board, Appendix 1-10

FIGURE 6

SOILS MAP

Boundary of Anderson Valley EAR Area

Soil legend on following page

MAP LEGEND (for figure 6)

SLOPE GROUPS

| Symbol [1/] | Dominant Slope Range (percent) |
|---|---|
| 1 or no symbol | 0-3, nearly level |
| 2 | 3-7, gently sloping |
| 3 | 7-12, sloping |
| 4 | 12-20, moderately steep |
| 5 | 20-35, steep |
| 6 | 35-60+, very steep |

1/ Numbers below the line in map combinations represent slope classes, e.g. /5=20-35% slope

Soil boundary and mapping unit symbol $\frac{S76\text{-}96}{5\text{-}6}$

Note: Soil and slope symbols in map delineations appear in order of dominance.

## Land Use

All of the lands of concern are national resource lands administered by the Bureau of Land Management. The lease offers involved are:

| | |
|---|---|
| OR 7412 | 2,527.97 Acres |
| OR 7413 | 2,440.00 Acres* |
| OR 7424 | 1,760.71 Acres |
| OR 7435 | 800.00 Acres |
| | 7,528.70 Acres |

Contiguous lands have been under oil and gas lease for about five years:

| | | |
|---|---|---|
| Federal Leases (28): | (NRL Surface) | 56,116.81 Acres |
| | (Pvt. Surface) | 2,360.00 Acres |
| State Leases : | | 5,920.00 Acres |
| Private Leases : | | 1,280.00 Acres |
| | | 65,676.81 Acres |

The national resource lands are administered under the multiple use management concept. The state lands are managed to generate revenue for the support of public education. The private lands are expected to either generate revenue directly or indirectly by supplementing more intensively used properties (ranch base properties).

Domestic livestock grazing is by far the primary economic activity on these lands. They are also managed for wildlife habitat, watershed, recreation and open space.

Two gravelled county roads traverse the lands, a north-south road from State Highway 78 to Anderson Valley and a northwesterly-southeasterly road from Princeton to Anderson Valley. Both roads were appropriated by the county under the automatic grant provision of R.S. 2477. The Princeton-Anderson Valley road is paralleled by a common right of way 20 feet wide containing an aerial power distribution line belonging to Harney Electric Cooperative, Inc. (Right-of-Way ORE 05183) and buried telephone cable belonging to Pacific Northwest Bell Telephone Company (Right-of-Way ORE 018562).

Although the dam and part of the reservoir is on private land, a portion of Mahon Reservoir is within the proposed lease area. Authorized by Right-of-Way TD 025836, this irrigation reservoir had an original designed capacity of 3,456 acre feet. It now appears to cover a maximum of about 60 surface acres and is no longer usable for irrigation because the spillway structure has been breached.

* Includes 320 acres of land reconveyed to the United States in Private Exchange ORE 010975, with a restricted mineral estate. These 320 acres may or may not be subject to federal leasing.

A mineral material site, containing red cinders, is also located in the proposed lease area. This site was developed in trespass by the county road department several years ago when the north-south county road mentioned above was relocated and upgraded.

Existing land uses are physically compatible in their present intensity, with some minor exceptions. The mineral material pit presents some visual resource, livestock grazing and wildlife habitat problems. Other existing and potential conflicts occur, to a minor extent, between wildlife, livestock grazing and watershed. Primary recreational use is hunting for chukars, deer, and antelope. The area is so small, no estimates can be made of the number of hunters.

## Air

Prevailing winds are westerly with the most wind movement occurring in the spring. Local wind storms with velocities in excess of 60 mph (96 km/hr.) occasionally occur. Warm southwest winds in winter and spring melt accumulated snow and create rapid runoff.

Air quality is good over much of the region. The major sources of particulate matter originates from the Hines mill and transportation vehicles. Occasional dust storms deposit large amounts of particles in the air for short periods of time. Carbon monoxide, hydrocarbon, nitrogen oxide, and sulfur oxide concentrations are all extremely low because of the low traffic volumes, absence of large population centers and small numbers of polluting industries in eastern Oregon.

## Temperature

Mean annual temperature in the Burns area is approximately 44 degrees F. (7 degrees C). Table 1 is a compilation of the climatological data recorded by the National Weather Service in Burns.

## Non-Ionizing Radiation

There are no known sources of radiological contamination within the area. The level of non-ionizing radiation on national resource lands is unknown.

## Water

Table 2 shows the average monthly precipitation as recorded at the National Weather Station in Burns. Much of this precipitation falls during the winter months in the form of snowfall. July, August and September are the driest months with less than 10 percent of the annual total precipitation.

Most of the runoff in the lease area occurs in winter and early spring and varies from one to two inches (2.5 to 5.0 mm). Warm spring chinook winds cause rapid snow melt and consequently heavy runoff.

As typical of eastern Oregon, the evaporation rate is high with pan evaporation varying from 40 inches (102 mm) in the forested areas to 60+ inches (152 mm) in the lower, open valleys.

There are no perennial streams in the area. The intermittent streams are small but carry great amounts of water and sediment during short periods. Average annual sediment production in acre-feet per square mile is less than one-tenth, but varies widely according to geology, soils, amount of runoff, slope, land treatment practices and upstream watershed conditions. All of the stream flow not consumptively used flows into Malheur and Harney Lakes in the Harney Basin where it dissipates by evaporation. Many of the smaller streams have little or no flow except during periods of melting snow and high runoff.

Coliform contamination is generally low in surface waters due to the low human population denisty. The coliform counts are higher in the areas of animal concentrations and soil bacteria.

Ground water is usually found in alluvial deposits and some volcanic rocks at a depth of 60 (18 m) to 600 feet (180 m). These volcanic rock aquifers are only moderately permeable but the annual recharge to these aquifers is very low. The quality of the ground water is fair to good.

Mahon and Reeds Basin reservoirs are located in the analysis area (Figure 6). The primary purpose of the reservoirs is to provide water for livestock, but also provide water for wildlife and habitat to the aquatic plants and amphibians. The availability of water in these reservoirs is adequate in most years. Projected needs for municipal, industrial, domestic, and livestock water in the Harney Basin will double by the year 2020. But ground water supplies are estimated to be adequate to meet the demand.

## Selected References

Phillips, K. N., 1969, Water Resources of Oregon: Mineral and Water Resources of Oregon, Oregon Department of Geology and Mineral Industries, Bill 64.

Western U. S. Water Plan Study for Oregon, 1973, U. S. Department of Interior, Bureau of Reclamation and Pacific Northwest River Basins Commission, Salem, Oregon.

Table 1*

Average Monthly Temperature

| Month | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $F^{o}$ | 24.8 | 29.7 | 37.4 | 46.0 | 53.4 | 56.8 | 69.5 | 67.2 | 58.8 | 48.4 | 46.1 | 29.4 |
| $C^{o}$ | -4.0 | -1.3 | 2.9 | 7.7 | 11.7 | 13.6 | 20.6 | 19.3 | 14.7 | 9.0 | 7.8 | 1.4 |

Table 2*

Average Monthly Precipitation

| Month | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| in. | 1.76 | 1.18 | .92 | .70 | 1.03 | .97 | .32 | .44 | .46 | .89 | 2.42 | 1.73 |
| cm. | 4.47 | 3.00 | 2.39 | 1.78 | 2.62 | 2.46 | .81 | 1.12 | 1.17 | 2.26 | 6.15 | 4.39 |

* Source: Climatological Data, U. S. Department of Commerce

## Vegetation

A reconnaissance field examination was made of the vegetation in the analysis area. Because of the time of the year (mid-summer), some genera were not present and other types of certain genera could not be identified. Thus, Table 3 is only a partial list of the vegetative types found in the analysis area.

This list had been divided into the type of vegetation (grass, grass-like, forbs, trees and shrubs) and whether it was found in the upland area, lowland area or both. The difference between upland and lowland areas is gradational but was divided on the basis of elevation, precipitation, soils, aspect, past use, etc.

The upland area is characterized by grasses such as bluebunch wheatgrass, Sandberg's bluegrass, giant wildrye, and some needlegrass and cheatgrass interspersed with forbs like falseyarrow (chaenactis douglas II), gromwell, phlox, and large flower collomia. Juniper, currant, hopsage, and big sagebrush also occupy the upland area. Grasses are less abundant when these trees and shrubs occupy an area.

The lowland area has some of the same genera of vegetation as the upland area but a few which are common only to the lowland area. For instance crested wheatgrass is very common in the lowland area, particularly in the BLM seedings. Some forbs common to the lowland area are waterplantain, wild onion, fiddleneck, goosefoot, tansymustard, tumblemustard, goldenrod, and cocklebur. Juniper, although present, is not as prevalent in the lowland area. Rabbitbrush, big sagebrush, hopsage rabbitbrush and horsebrush are the more common shrubs.

No threatened or endangered species of plants were found in the lease areas nor adjacent areas from the field investigation.

## Selected References

Franklin, J. F., Dyrness, C. T., 1973, Natural Vegetation of Oregon and Washington: USDA Forest Service General Technical Report PNW-8; USDA, Forest Service, Portland, Oregon.

Department of Interior, Fish and Wildlife Service, 1975, Threatened or Endangered Fauna or Flora; Federal Register, Part V, Vol. 40, No. 127.

## Wildlife

The Anderson Valley Oil & Gas Area provides habitat for a wide variety of wildlife. Some of the common songbirds found in the area include meadow larks, horned larks, sage sparrows, Brewer's sparrows, sage thrashers and loggerhead shrikes.

TABLE 3. GENUS LIST

GRASSES

| * | Genus | Common Name |
|---|---|---|
| a | Agropyron cristatum | fairway crested wheatgrass |
| b | Agropyron spicatum | bluebunch wheatgrass |
| ab | Bromus Tectorum | cheatgrass Brome |
| ab | Elymus cinereus | Giant wildrye |
| ab | Poa secunda | Sandberg bluegrass |
| a | Polypogon | Polypogon |
| ab | Sitanion Hystrix | bottlebrush squirreltail |
| a | Stipa Thurberiana | Thurber needlegrass |

GRASSLIKE PLANTS

| | | |
|---|---|---|
| a | Carex | sedge |
| b | Juncus | rush |

FORBS

| | | |
|---|---|---|
| ab | Achillea Lanulosa | yarrow |
| a | Alisma | waterplantain |
| a | Allium | onion |
| ab | Alyssum | |
| a | Amaranthus | amaranth |
| a | Amsinckia | fiddleneck |
| ab | Antennaria | pussytoes |
| ab | Aster | aster |
| ab | Astragalus | Milkevetch loco |
| a | Blephariapoppus | |
| b | Belphariapappus scaber | |
| a | Boisduvalia | spikeprimrose |
| a | Calochortus | mariposa |
| b | Calochortus opiculatus | pointedtip mariposa |
| a | Camelina | falseflox |
| a | Cardaria | |
| a | chaenactis | falseyarrow |
| b | Chaenactis douglas II | falseyarrow |
| a | chenopodium | goosefoot |
| a | chorispora | chorispora |
| ab | cirsium | thistle |
| b | collomia granidflora | largeflower collomia |
| b | Cordylanthus | birdbeak |
| ab | crepis | hawksbeard |
| ab | delphinium | larkspur |
| a | descurainia | tansymustard |
| ab | epilobium | willowweed |

* a - located in lowland areas
  b - located in upland areas

| * | Genus | Common Name |
|---|---|---|
| ab | erigeron | fleabane |
| ab | eriogonum | buckwheat |
| a | helianthus | sunflower |
| a | lactuca | lettuce |
| a | lepsidium perfoliatum | clasping pepperweed |
| b | lithospermum | gromwell |
| a | lomatuim | biscuitroot lomatuim |
| ab | lupinus | lupine |
| a | lygodesmia | skeletonplant |
| a | modia | tarweed |
| a | medicago | medic |
| a | melilotus | sweetclover |
| a | Navarretia | navarretia |
| ab | oenothera | eveningprimrose |
| ab | penstemon | penstemon |
| ab | phacelia | phacelia |
| b | phlox | phlox |
| a | plagiobothrys | popcornflower |
| b | plectritis | plectritis |
| ab | polemonium micranthum | littlebell polemonium |
| a | polygonum | knotweed |
| a | rumex crispus | curly dock |
| a | salsola | russianthistle |
| b | scutellaria | skullcap |
| a | sisymbrium | tumblemustard |
| a | solidago | goldenrod |
| b | stephanomeria | wirelettuce |
| a | Thermopsis | Thermopsis |
| ab | tragopogon | salsify |
| a | typha | cattail |
| a | verbena | verbena |
| a | veronica | speedwell |
| ab | vicia | vetch |
| a | wyethia | wyethia |
| a | xanthium | cocklebur |
| ab | Zigodemus venenosus | meadow deathcamas |

TREES & SHRUBS

| | | |
|---|---|---|
| ab | artemisia tridentata | big sagebrush |
| ab | atriplex confertifolia | shadscale |
| ab | chrysothamnus | rabbit brush |
| a | grayia | hopsage |
| b | holodiscus | oceanspray |
| ab | juniperus | juniper |
| ab | Ribes | currant, gooseberry |
| a | tetradymia | horsebrush |

* a - located in lowland areas
  b - located in upland areas

Golden eagles, nighthawks and sparrow hawks are common residents. Turkey vultures, ravens and magpies are also resident to the area. Mourning dove and western rattlesnakes are found in the area. Sage grouse use the area, although no strutting grounds have been documented.

Mahon Reservoir, an estimated 85 surface acres at high water, is valuable waterfowl habitat. Early spring and fall migrants make considerable use of the reservoir.

BLM bird counts on 5/11/76 found two ruddy ducks, two gadwalls, six pintails, one unidentified duck, eight eared grebes, and six coots. No waterfowl production was documented by U. S. Fish and Wildlife Service aerial counts in 1975. Shorebird use on the reservoir is usually light.

Other reservoirs in the area have little or no waterfowl use. No threatened or endangered species on either the Federal or State lists are known to habitat the area.

The lease area may be separated into two habitat types (Figure 7) based on marked differences in topography, vegetation and animal use, as follows:

Type I

This type consists of relatively flat to rolling hills with occasional low, rocky rims breaking the landscape. Black-tailed jackrabbits are common to this type.

Low, rocky rims are an important component of Type I. Songbirds, pygmy rabbits and desert wood rats make heavy use of these rims.

Belding's ground squirrels are found in areas with deep soil.

Sage grouse, chukar, mule deer use is light.

Oregon Department of Fish and Wildlife estimates 40 antelope make heavy use of the area during the summer and occasional use during the winter. Mule deer use is light throughout the year.

Type II

Steeply sloped uplands are frequently broken by low to high (+30 feet) rocky rims. This type has little use by antelope although rims do provide some cover for summering mule deer.

This type is excellent chukar habitat, with an abundance of birds in the rim areas. Sage grouse use the area. Raptors probably nest in this type, although no nests have been documented.

A list of wildlife species that could be normally found on the lease area is included in the Oregon Department of Fish and Wildlife letter in Appendix H. No areas have been identified as critical.

R. 35 E.

T. 28 S.

TYPE 1

TYPE 2

WELL

Creek

Camp

MANON RES

REEDS BASIN RES

TOM JENKINS RANCH

ANDERSON VALLEY RANCH

Indian Creek

LOUIES DRAW RES

Neals Lake

Cold Spring

FIGURE 7

WILDLIFE HABITAT AREAS

LEGEND

Boundary of Anderson Valley EAR Arec

Type 1- Valleys and rolling hills — Rodents, songbirds, mule deer and antelope

Type 2- Uplands — chuckar, sage grouse, some mule deer, raptors

## Ecological Interrelationships

Because of the variety of sites and corresponding plant communities, plant successions are complex and diversified. The following is a broad overview of the more prominent successional patterns.

Juniper woodlands are dependent upon different factors. The older juniper trees are generally found in small swales and on rocky ridges with relatively deep soil between the rocks. Heavy grazing over a prolonged period and suppression of natural fires have greatly extended the area covered by this species. Juniper is adapted to a wide range of sites and with adequate moisture it may invade rapidly as perennial grasses and shrubs lose vigor. Once established, juniper generally maintains dominance of a site. Perennial grasses and shrubs are forced out and tree interspaces support annual forbs and grasses. The degree of plant variety decreases with the severity of the site.

The sagebrush communities can be broken into two general categories--big sagebrush and low sagebrush. Low sage generally occurs on the shallow stony sites of well drained upland plateaus.

Big sagebrush is best adapted to deep, well drained soils and is often found in association with bitterbrush and rabbitbrush. Due to the combination many of the preferred browse and grass species have declined and the extent and density of sagebrush and rabbitbrush have increased.

On many deer winter ranges, sagebrush is a critical browse. This grazing use, domestic livestock grazing, plus other land disturbances, has resulted in an increase in gray rabbitbrush and cheatgrass.

There are other factors besides grazing that have initiated ecological changes. Road building, indiscriminate off-road vehicle use, have caused deteriorated conditions in varying degrees.

These deteriorated conditions allow increased runoff and a consequent increase in soil movement. Poor watershed conditions cause increased sediment loads from sheet, rill, gully and channel erosion. Erosion reduces the plant production potential by reducing soil fertility, thus reducing the availability of suitable habitat for forage species.

The natural ecological trend is slow movement towards a mature stand of dominant species. Many successions initiated by past improper land uses are reversible. The reversal of the pattern, especially if time is important, may require drastic action such as chemical and/or mechanical vegetation conversion for wildlife, watershed and livestock values.

### Food and Community Relationships

Within the analysis area there are numerous food relationships between plants and animals. All are dependent initially upon the production of food materials by green plants. The existing vegetation and many other environmental factors dictate what animal species will inhabit an area.

Deer are dependent upon specific seasonal use areas to provide year long forage, water and cover. Forage requirements and availability change with the season. The wintering deer require a variety of shrubby browse plants and lesser amounts of herbaceaous plants.

Domestic livestock, on the other hand, do not require the same variety of forage. They can survive some seasons on strictly a grass diet.

Predators such as coyotes, bobcats, badgers and raptors prey primarily on rodents, rabbits, other small mammals and reptiles. Rodent and rabbit populations are somewhat cyclic and governed to a large extent by production of forage and seeds for food. During periods of low rodent and rabbit populations predators may shift to prey species that are available or may change feeding ranges until food sources improve.

The most critical component of all the food relationships is water. The seasonal and geographic distribution of water supplies strongly influence the numbers and distribution of floral and faunal species. Water developments such as spring improvement and reservoir construction often enhance and expand habitat for many species. Natural water supplies may require supplementation, particularly in drought years, in order to sustain dependent populations. The water supply is often the limiting factor in the food chain.

## Human Values

Although it does not contain as much variety as other parts of Oregon, the lease area does possess different topographic features and vegetative types. It is a transition zone between the Harney Basin, a closed basin of meadowland and sagebrush-greasewood covered rangeland with the Owyhee Upland to the east and the Basin and Range to the south. Although roads, stockwatering ponds, and fences make one aware of man's activities, there still remain elements of open spaces.

BLM's analysis of the scenic values of the area has placed the area in a Class IV management category. The Class IV management activities (including oil and gas operations) which are visually apparent may be located in critically sensitive areas such as prominent features, long view duration areas, enframed views, and other critical focus areas if such modifications are subjected to sensitive analysis by visual design arts disciplines.

### Socio-Cultural Interests

The first white men to appear in Harney County were fur trappers and traders in about 1826. There they found northern Paiute Indians, who inhabited southeastern Oregon. The Ochoco Mountains were a namesake of Chief Ochoco, whose band used the Ochoco Valley as a camping ground.

Later, wagon trains going to the Willamette Valley transversed the basin, but homesteaders did not begin to settle until about 1860. About 1865, in order to protect these settlers, General William Selby Harney became commander of the territory of Oregon. It was from him that Harney County was named. But credit for the permanent settlement must go to the cattlemen. Seeking big country and open range, they moved in from California, Nevada, and western Oregon. By 1880 the military had left, but large numbers of homesteaders remained.

The town of Burns wasn't founded until 1884 when George McGowan named the town after the Scottish poet Robert Burns and a post office was opened. The small community progressed slowly until the coming of the railroad in 1924 and the construction of the mill in Hines in 1930 and became the dominant center of commerce in the county. Today, Harney County has a population of about 7,200, 4,700 of which reside in the towns of Burns and Hines. There is only one known historic site within the lease area. The John Jenkins homestead (Section 14, T.28S., R.34E.) is on private land within the area. Three historic sites are near the lease area. They are: 1) the townsite of Princeton, 2) the site of Follyfarm, and 3) the county road to Barren Valley.

Many county organizations and individuals preserve the flavor of the old west by purchasing and retaining old historic relics. Harney County has an active historical society and historical museum.

Selected References

Harney County Chamber of Commerce.

Brimlow, G. F., 1951, Harney County, Oregon, and its Rangeland: Metropolitan Press, Portland, Oregon.

Archaeology

The literature search for the Anderson Valley lease area included review of all relevant archaeological and historical sources available. Theoretical works concerned with the major problems of Great Basin archaeology were carefully considered.

Persons knowledgeable of the area were contacted. This information is contained in the body of this report and copies of their replies are included in Appendix H).

This report constitutes a literature search on archaeological and historical resources for the Anderson Valley oil and gas lease. The purpose was to compile relevant data from the literature as a preliminary investigation into the archaeological and historical values of the area. Limitations of time, personnel, weather, and the size of the area, actual on the ground reconnaissance is not feasible at this time. At such time that a ground search is conducted, this report should assist in the formulation of the reconnaissance plan.

## The Prehistoric Culture

The cultural trend of the western desert during prehistoric times has been generally described by J. Jennings (1968). Desert culture is distinctive in its total environment exploitative pattern. Highly adapted to an ecosystem controlled by conditions of aridity, aboriginal peoples of the western desert followed a pattern of seasonal migration. Ranging from Sonoran to Arctic-Alpine environments, they exploited a different inventory of species in each ecological zone.

While technological development was rudimentary, utilization of natural resources was skillful. A modified list of diagnostic artifacts of desert culture includes such traits as an intensive, unrestricted exploitation of species, small seed harvesting (predominantly pinion pine); fur cloth (mainly rabbitskin); woven sandels (sometimes hide moccasions); the atlatl (throwing board) and dart; a wide variety of projectile points, knives, milling stones, choppers and scrapers; wooden clubs; tubular pipes or sucking tubes; vegetable quids; basketry; oliva and olivella shells from California; and bone awls.

Desert culture reflects 12,000 years of continuous adaptation to an arid climate. Comparisons of artifact inventories such as those from Danger Cave (Jennings, 1957) and Hogup Cave (Aikens, 1970) in Utah, Fort Rock and Roaring Springs Caves (Cressman and Krieger, 1940) in Oregon, and Humboldt Cave (Heizer and Krieger, 1956) and Lovelock Cave (Loud and Harrington, 1929) in Nevada evidence a broad similarity in both content and time span of desert culture for the northern Great Basin.

Since the 1950's and the development of the radio-carbon dating technique, scores of western desert sites have yielded dates of 8,000 to 10,000 years old. In Oregon, one of the 75 woven sandles Cressman discovered in Fort Rock Cave was dated as more than 10,000 years old.

## Recent Cultural History

The Northern Paiute Indians inhabited the Harney and Alvord Basins when explorers and trappers first reached southeastern Oregon. For the fifty years prior to their final confinement to reservations in 1870's their way of life underwent radical change and adaptation to encroachment by whites. Some of the native people adopted a nomadic raiding pattern that increased white hostility and accelerated the inevitable move to confine them.

The undisturbed precontact form of life was never recorded. Ethnographic studies have rescued information on the historic Paiutes, but it is the task of archaeology to reconstruct aboriginal lifeways prior to contact and the acquisition of the horse. Basic descriptions of historic Paiutes is contained in The Northern Paiute Bands by Omar C. Stewart, Ethnography of the Surprise Valley Paiute by Isabel T. Kelly, Karnee: A Paiute Narrative by Lolla Scott, and Paiute Sorcery by Beatrice B. Whiting.

## Review of Previous Archaeological Research

Four major research problems are central to Great Basin prehistory. They are: 1) The chopper-scraper issue; 2) The debate on altithermal occupation of the Great Basin; 3) The problem of chronology in an area where most finds lack stratigraphic context; and 4) Studies on regional variants of settlement/subsistence network patterns.

The Chopper-Scraper Issue: Alex Krieger (1964) views this complex as a very ancient substratum upon which American cultural traditions are based. There are never any associated projectile points, finely chipped knives, or other more specialized tools. The point of contention with these crude, percussion-flaked tools is their professed antiquity. On typological grounds the complex can be equated with the Early and Middle Paleolithic of Eurasia. Logic thus requires a a pre-Wisconsin entry of man into the new world, yet many archaeologists are unwilling to accept even a mid-Wisconsin date.

No chopper-scraper site has yet satisfied even minimum control standards insisted upon by archaeologists for the validation of antiquity. Most collections are surface finds or claim age ascriptions that do not support rigorous examination. Resolution of this issue with proof of age for the complex would be a key contribution to archaeology.

The question of the earliest human occupation of the Great Basin is a related concern. The earliest confirmed date of 13,200 + ± 700 B.P. comes from Fort Rock Cave. Since this site was occupied only after the lowering of the Pleistocene Lake levels, it is logical that man was in this region before that date. Earlier sites should be associated with fossil waterways, terraces, or beaches. The eastern edge of the lease area borders a small playa. This feature increases the potential of discovering early sites in the higher elevations of the lease area.

The Altithermal Problem: The Neothermal concept of climatic change proposed by Antevs (1948) has been generally accepted for the Great Basin. The scheme is based on complex correlations between temperature, rainfall, storm paths, palynological finds, stand lines on fossil lakes, recent sediments, fossil watercourse histories, and theories about runoff rates and erosional patterns. Antevs hypothesized a three-phase temperature sequence for the last 10,000 years. The middle period (the Altithermal) was characterized by conditions warmer than the present, and is the time many of the Great Basin lakes are thought to have dried up.

This period was dated by Antevs as occurring between 7,000 and 4,500 years ago. The concern here is with the effects of the hot, dry Altithermal climate on human occupation of the Great Basin. Did it represent a drastic change in climate, and was the region abandoned totally or only selectively during this time?

References which contain environmental data and document Altithermal occupation in southeastern Oregon are: Meinzer's (1922) study of Pleistocene lakes and shorelines, Bedwell's (1970) study of the prehistory and environment of the pluvial Fort Rock Lake area of south central Oregon, and Fagan's (1974) study of Altithermal occupation of spring sites in southeastern and south central Oregon.

Oregon Archaeological Survey Site #35 HA 25 (Fagan, 1974) is located just outside the lease area. Fagan suggests that early sites are most frequently located at higher elevations, generally 5,000-6,000 feet. Much of the lease area has an elevation within this range. Furthermore, a number of springs and streams indicate good potential for archaeological sites of significance.

Chronology: Chronological ordering of sites in the Great Basin has been complicated by erosional and climatic factors that have left most sites lacking good stratigraphy and chemically datable artifacts. Typological cross-dating of projectile point types has become an acceptable method of dating these sites. An index series of point types is compiled from stratified, datable sites in the region. In this way, the series is bolstered by radio-carbon, obsidian hydration, and geologic dating information. The series is then used as a reference for dating sites not datable by other means.

Some work on chronology has been done for the Harney and Alvord Basins, notably John Fagan, 1974. On the basis of the index series, he formulated a sequence of four periods: Period I, 150 to 3,000 B.P.; Period II, 3,000 to 5,000 B.P.; Period III, 5,000 to 7,000 B.P.; and Period IV, 7,000 to 11,000 B.P. Because of the tenuity of the method, more typological cross-dating for this area needs to be accomplished. Corroboration may be forthcoming from continuing research on previous archaeological surveys done in the area (Mack, 1975; Newman, 1975; Pettigrew, 1975).

Regional Variants of Desert Culture: Regional variation of exploitative patterns in the Great Basin can be seen diverging by 5,000 years ago. At the heart of the Great Basin, Humboldt and Lovelock Caves mark a specialization towards a lacustrine environment (Jennings, 1964; Loud and Harrington, 1929; and Heizer and Krieger, 1956).

M. Weide (1968) has formulated a model of lakeside adaptation for the Warner Lakes area in Oregon. The scheme has three poses: 1) winter villages of some size and permanence close to permanent water sources; 2) small, temporary and dispersed summer and spring encampments near freshwater springs and streams; and 3) small, upland hunting camps.

The Harney and Alvord Lake Basins, both remnants of Pleistocene lakes and formerly of greater extent, should be examined with reference to these models of lacustrine adaptation. Two reconnaissance studies have

been conducted by the Bureau of Land Management for the Alvord Basin proper, but interpretive work is lacking (Newman, et al, 1975; Pettigrew, 1975). It has been suggested that the relatively lower elevations around the Anderson Valley area may have served aboriginally as a migration route between the Harney and Alvord Basins.

The Anderson Valley lease area has significant potential for cultural resources. It contains playas, which formerly being lakes, are likely to be bordered by archaeological sites. This section of the Steens fault block is one of the few potential passes between the Harney and Alvord basins, and is likely to have served migrating aboriginal peoples.

During the last 50 years increasing numbers of archaeological sites have been damaged or destroyed by amateur collectors. It is only in more remote areas, such as the lease tract, that sites have been less subject to this activity. Undiscovered sites within the lease area have a potential of providing data lacking at other sites as a result of amateur collecting.

## Selected Reference


Aikens, C. Melvin
1970 Hogup Cave. University of Utah Anthropological Papers 93. University of Utah Press.

Antevs, Ernst
1948 Climatic Changes and Pre-White Man. University of Utah Bulletin, 38(20): 168-191.

Bedwell, Stephen F.
1970 Prehistory and Environment of the Pluvial Fort Rock Lake Area of South Central Oregon. Ph.D. Dissertation, Department of Anthropology, University of Oregon.

Cressman, L. A., Howell Williams and Alex Krieger 1940
Early Man in Oregon: Archaeological Studies in the Northern Great Basin. University of Oregon Monographs, Studies in Anthropology, No. 3. Eugene.

Fagan, John L.
1974 Altithermal Occupation of Spring Sites in the Northern Great Basin. University of Oregon Anthropological Papers, No. 6. Eugene.

Heizer, R. F., and A. D. Krieger
1956 The Archaeology of Humboldt Cave. Churchill County, Nevada. University of California Publications in American Archaeology and Ethnology 47(1): 1-190.

Jennings, Jesse D.
1957 Danger Cave. University of Utah Anthropological Papers 27.

1964 The Desert West. In "Prehistoric Man in the New World" ed. by J. D. Jennings and E. Norbeck: 149-174. University of Chicago Press, Chicago.

1968 Prehistory of North America. New York: McGraw-Hill Book Co.

Kelley, Isabel T.
1932 Ethnography of the Surprise Valley Paiute. University of California Publications in American Archaeology and Ethnology. University of California Press.

Krieger, Alex
1964 Early Man in the New World. In "prehistoric Man in the New World" J. D. Jennings and E. Norbeck (eds): 23-81. University of Chicago Press.

Loud, L. L. and Mark R. Harrington
1929 Lovelock Cave, University of California Publications in American Archaeology and Ethnology 24(1): 1-183.

Mach, Joanne M.
1975 Cultural Resources Inventory of the Potential Glass Buttes Geothermal Lease Area, Lake, Harney, and Deschutes Counties, Oregon. Final Report to BLM, University of Oregon, Department of Anthropology, Eugene.

Meinzer, Oscar
1922 Map of the Pleistocene Lake of the Basin and Range Province andits significance. Bulletin of the Geological Society of America, 33: 541-552.

Newman, Thomas M., Robert Bogue, William Cannon, Ruth McGilvra, and
1975 Roger Wiggin.
Alvord Desert Potential Geothermal Resource Area Cultural Resource Survey. Final Report to BLM, Portland State University Department of Anthropology. Portland.

Pettigrew, Richard M.
1975 Cultural Resources Survey in the Alvord Basin, Southeastern Oregon. Final Report to BLM, University of Oregon, Department of Anthropology. Eugene.

Scott, Lolla
1966 Karnee: A Paiute Narrative. University of Nevada Press.

Steward, Omer C.
1939 The Northern Paiute Bands. University of California Anthropological Records, Vol. 2, No. 3: 127-149.

Weide, Margaret L.
1968 Cultural Ecology of Lakeside Adaptation in the Western Great Basin. Ph.D. Dissertation, University of California, Los Angeles.

Whiting, Beatrice
Paiute Sorcery.

## Social Welfare

More than half of Harney County's population of 7,200 is centered in the Burns-Hines area and the rest is sparsely scattered throughout the county. The rural population is based primarily on ranching. Harney has the smallest population density in the state and has had little migration over the years, so that the slow growth can be attributed to natural increases. The major industries are lumber, livestock, agriculture and tourism. Wood products and lumbering are by far the largest industries in the area with wood products contributing 55 percent of the total payroll for the county. Most of the timber comes from the Ochoco and Malheur National Forests.

Livestock inventories have not increased, partly because of the recent troubled beef markets, but does show strong secondary employemt characteristics. Moreover, the Bureau of Land Management has a profound impact on livestock production in the county.

The recreation industry brings little income into the county because the tourist often drives a stocked camper and stays in campgrounds.

Although job opportunities are limited, income levels are healthy. Per capita income and median household cash income are both above state averages with a median income per capita of $7,429.

Even during the economic downturn of 1975, unemployment was only 7.7 percent. Employment opportunities are most numerous in semi-skilled and unskilled categories but professional jobs remain scarce. The trades, services and government sectors show cutbacks whenever there is a slight economic downturn.

The services provided in the county are typical for a county with a small population and limited tax base. The per pupil school costs are about equal to the state average, partly because of the small school age population and high operating costs. Expenditures per pupil were $1,248 in 1972-73. The county's health budget is about average for the state. However, the health center in Burns lacks adequate facilities and is scheduled for modernization. There are no special health projects in Burns, but there is a relatively large mental health budget for the county.

Only a few service organizations are available to county residents as compared with most county organizations and reflect the long distances separating residents of Harney County.

### Selected References

Beecherl, A., 1975, A Social and Economic Profile of Eastern Oregon Counties: BLM Report (Western Interstate Commission for Higher Education, Boulder, Colorado).

## Attitudes and Expectations

Harney County began as a cattle ranching area and has remained such since its early days. But today, in order to survive, ranches require larger acreages and equipment investments than ever before. When it was introduced in the 1930's, the lumber industry brought diversification to the county's economy and will remain a stable element of the economy, but with little future growth.

Because of the lifestyle of hard physical labor, Harney citizens have developed an attitude and value system based on the work ethic and self-sufficiency. As cattlemen and farmers, they see themselves as vestiges of the American pioneering struggle to survive. In them, the traditions of the old west still remain, and they, like their ancestors, would struggle to protect their way of life. However, potential conflicts may arise because of the growth of the recreation-tourist industry. The tourists are seen as "outsiders" to the local people and they feel that these outside influences may erode their values and way of life.

Special interest groups have become an influential force, particularly in the areas of BLM management actions. The special interest groups probably neither support nor oppose the majority of BLM decisions unless the specific action affects their interests or livelihood. Their involvement may then become substantial.

It is difficult to assess the general public's attitudes and expectations about oil and gas leasing in Harney County because of the lack of recent leasing or exploratory activity. Only in early years were exploratory holes drilled and these were mostly shallow. Of the 11 exploratory test wells drilled in Harney County, only one (the United Company of Oregon and Weed and Poteet Well) was drilled to a depth greater than 5,000 feet (1650 m). This well penetrated 6,480 feet (1944 m) of volcanic flows and pyroclastic material that was concurrently deposited with greenish clays and silts. The well had reported traces of hydrocarbons and several other shallower wells indicated small flows of gas or traces of oil.

Standard Oil of California, with an exploratory test well, hopes to intersect the marine sediments that contain oil and/or gas. Chances of striking a pay zone are slim, for the national average of discovering a pay zone in 1974 was 1 in 7, and the chances of finding oil or gas in significant amounts were 1 in 59.

Since oil and gas activity is so limited in the county, energy development is not discussed in the "Comprehensive Land Use Plan" published by the Harney County Planning Commission in 1972. Nevertheless, the policy of the Planning Commission is a reflection of the county's attitude toward any future development in the county. The policy of the Planning Commission is:

1. To preserve an environment that will encourage and enhance existing and future industries, thus maintaining a continuing and vigorous economic expansion of the industries involved.

2. To encourage new industries compatible with the natural resources to develop within the county, consequently located and compatible with their needs and available resource. However, it is essential that the Harney County Planning Commission maintain an orderly and systematic use of all resources, thus assuring wise land use planning.

3. To encourage commercial development in concentrated clusters rather than strip areas along streets and highways.

4. To encourage commercial and industrial development to design an attractive construction so as to be compatible to the surrounding businesses and uses.

5. To encourage commercial facilities to locate within present or planned water service areas.

Some of the private land owners have leased their oil and gas rights to Standard Oil of California (Figure 1). They are interested in obtaining an added source of income.

Selected References

Mineral & Water Resources or Oregon, 1969, Bull. 64, State of Oregon Dept. Geology and Mineral Industries.

Beecherl, J., 1975, A Social and Economic Profile of Eastern Oregon Counties: BLM Report.

Local Regulatory Structure

A Harney County planning and zoning ordinance that guides development outside the incorporated communities of Burns and Hines was adopted in 1971. This ordinance has classified most of the study area as an agricultural zone, which is described as "extended to preserve certain land exclusively for agricultural and related uses which land while so used is exempt from zoning and land use regulations." This ordinance also states that it will prevent intensive development "in areas where proper community services are not readily available, where certain activities would be in conflict with an orderly development of suburban areas, or where agricultural and related operations constitute the most appropriate use of the land."

Oil and gas operations are mentioned as one of the conditional uses of the land under this ordinance. The county planning commission, which is composed of residents appointed by the court, regulates these conditional uses on a case-by-case basis.

# ANTICIPATED ENVIRONMENTAL IMPACTS

## Introduction

This section describes the anticipated environmental impacts of oil and gas activities on the components which were identified in the previous chapter. The five phases of an oil and gas operation, as described in chapter one, comprise a step by step procedure with each succeeding step dependent upon successful indications in the previous step. Only a few oil and gas explorations go beyond the drilling of a wildcat well. Nevertheless, each succeeding phase is a more intensive operation with the degree of environmental impact greater than in the previous phase.

This portion of the analysis is based on the premise that an exploratory wildcat well could lead to oil and gas discoveries on any lease tract, even though the probabilities are slim. The impacts described will not include those resulting from the transportation in crude oil to refineries or the refining of petroleum products. This analysis defines those impacts resulting from oil and gas field operations.

Many of the impacts discussed in this chapter would occur only if federal and/or state requirements were not met.

## Preliminary Investigation

Most of the activities conducted in a preliminary investigation cause little or no surface disturbance. Examples are geological, geochemical and certain geophysical surveys. These surveys involve access by foot or vehicle transportation via existing roads and trails. They have little or no impact on the environment.

The most intensive use that may occur during a preliminary investigation is a seismic survey, which may involve clearing new access trails, using off-road vehicles, moving heavy equipment and in some cases, using explosives. Standard Oil of California (Chevron) conducted their seismic survey in 1971 under a Notice of Intent to Conduct Geophysical Operations, which was filed in the Burns BLM Office. They restricted their activity to existing trails and roads. They used a few explosives that resulted in some dust and noise. Those were the only impacts associated with their preliminary work.

### Exploration

Exploratory activities take place after the leases have been issued and are associated with drilling a wildcat well. This operation is described in Chapter One.

Constructing an access road, clearing the drill site pad, and moving heavy equipment would cause some air pollution. These activities may also result in destruction of vegetation, soil compaction and erosion, and a decrease in water quality.

Vehicle and heavy equipment traffic over unsurfaced roads during dry weather would raise heavy clouds of dust. The machinery would produce exhaust fumes, particulate matter and oxides of sulfur, nitrogen and carbon.

Any surface disturbance such as the construction of roads or drilling sites means adverse impacts on the vegetation. As heavy machinery compacts the soil, growth and reduction of available water suppresses plant growth. The potential for soil compaction is greatest when the soil is wet.

Soil is perhaps the most adversely impacted resource affected in this and later stages of an oil and gas operation. When vegetation is cleared, soils become more susceptible to erosion. If streams are forded without proper protection, the stream banks may erode and the soil may wash downstream. Generally, soil erosion depends greatly on soil compaction and vegetation removal.

The primary impact on water might be an increase in sediments in streams. Building roads and clearing operational sites could intensify siltation, especially if roads were hastily constructed by bulldozer and streams were forded by heavy equipment. Siltation can form barriers in streams and when the barrier breaks, the suddenly rapid flow can sharply increase the suspended sediment load.

Any surface distrubance would have a direct impact on archeological values. Disturbances of archeological sites mean not only loss of artificial materials, but destruction of site stratigraphy. Site stratigraphy is imperative for archeological studies. Surface sites are particularly vulnerable as merely clearing an area may completely remove the site. During excavations in the exploratory phase of oil and gas development, unknown sites may be encountered and destroyed.

Indirect impacts on archeological resources may also be associated with exploration for oil and gas. New or improved roads would provide access to the sites. Consequently more people, including amateur collectors, would invade the area. This "pothunting" is one of the major causes of site destruction in the United States. Only the areas not readily accessible to the public have escaped this type of damage.

Certain geologic hazards can be associated with a drilling. Fluids such as water and/or oil may be withdrawn causing reduced underground pressure. This may cause subsidence which in turn may result in structural damage to any manmade structures and to aquifers. Such accidents can be prevented by reinjecting unwanted fluids through injection wells as illustrated in Figure 3.

The diesel generators used in drilling the well would cause some air pollution in the form of exhaust emissions. The greatest threat to air quality lies in the event of a blowout. Although blowout preventers are

an integral part of the drilling rig, for every 5,000 wells drilled one suffers a blowout. The blowout may discharge natural gasses into the atmosphere. These may be odorous or toxic, or both, such as hydrogen sulfide, which smells like rotten eggs. These pollutants may be sprayed hundreds of feet into the air and in strong winds, can be carried for distances of more than a mile. A blowout can result in a fire when highly volatile hydrocarbons are ignited by contact with hot engine manifolds or sparks from engine exhausts. The fire may burn for days or weeks before it can be extinguished, emitting smoke and the products of hydrocarbon combustion into the atmosphere. But the greatest impact of a well fire is the safety hazard to construction crews and other people who may be nearby.

Fluids produced during the drilling (oil, brine, and the chemicals added to the drilling mud) can damage water, soil and vegetation. These toxic solutions can kill vegetation by direct contact or indirectly by making the soil sterile and unhabitable for plants. If the fluids escape and enter the watershed, dependent fauna and wildlife would also be jeopardized by the contaminated water.

Some ground water aquifers may be penetrated by the exploratory drilling. If the wells are not properly cased, according to both federal and state regulations, brines could contaminate ground water supplies. Effects of ground water contamination may be difficult to detect if the aquifer intersected a stream a long distance away or if a ground water pumping well were far from the producing well. The potential for future use of an extensive but undeveloped aquifer could be reduced.

The 20 to 25 men needed in the exploratory phase of drilling will probably reside at local motels and trailer parks for the 2 to 3 months period of exploration. The presence of these comparatively wellpaid employees would create an added income for the local merchants, but would place a burden on the community for goods and services.

Exploratory wells would have minor impacts on most animal species and habitat because of the small area involved. The biggest impact would involve the temporary displacement of most species of wildlife. Rodents inhabiting this small area could perish if displaced. Clearing of vegetation , road construction, and human activity and noise are important factors that would lower the quality of wildlife habitat on the exploratory well sites. Improper construction methods may cause erosional problems that would result in the deterioration of water quality and loss of fish and wildlife habitat. During exploratory drilling for oil, saline and hot water may be brought to the surface. If not contained properly, these pollutants could kill the aquatic life and habitat as well as other species. Containment of these pollutants in mud pits may entrap some species and the drilling mud additives may prove toxic to the wildlife that may drink from it.

The U. S. Department of Fish and Wildlife have raised the same concerns as mentioned in previous paragraphs (Appendix H). They state that the amount of disturbance to wildlife and their habitat depends on avoidance of detrimental exploration and construction practices and strict adherence to the state water quality regulations.

The Oregon Department of Fish and Wildlife feels that exploratory drilling on a limited scale (6-10 widely scattered wells) would not have a detrimental effect on wildlife or their habitat, unless the work involved disturbance of a substantial surface area and included new access development and/or improvement of current access (Appendix H). In addition, strutting grounds or wintering areas should be avoided. Nevertheless, they feel that an on-site inspection of proposed work areas is the best means of avoiding problems for the resident wildlife.

## Development

Many of the circumstances described in the exploration section are also true for the development phase, but the impacts become proportionately greater. Because there are many more wells drilled, roads and pipelines constructed and storage facilities built, there are many more chances for blowouts, leaks and spills. Soil erosion, vegetation destruction, air and water pollution and other impacts described in the previous section would occur on a larger scale. Because the area involved in the developmental stage is much greater, additional factors must be considered, such as conflicts with traditional land uses. Depending upon the circumstances, and Environmental Impact Statement may be required at this stage.

The possibility of accidents such as fires, blowouts and subsidence are safety hazards. Oil and gas activities would also produce noise, odors, and visual intrusions in undeveloped areas although most, if not all intrusions, will be hidden from the view of Highway 78 by the rolling hills that separate the proposed leases from the highway.

This phase of operations would also affect recreational uses and values. Construction of facilities would change the appearance and character of the land. Where development occurred, land would be removed from recreation use. Public access to operating fields, unless closely supervised, could be denied because of the possibilities of injuries and vandalism. Recreational uses that depend on motorized travel, such as fishing, hunting and rockhounding could benefit because of improved access. The resources, however, could be adversely impacted by increased people pressure, for instance, big game populations might be reduced by poaching as a consequence of improved access.

Because of the size of the area that might be involved in this developmental stage, the potential adverse effect on wildlife also becomes greater. The encroachment of oil and gas development on the habitat of deer, elk, antelope, small mammals and raptorial birds might force them

to migrate to other areas. The greatest hazard comes from harassment during crucial periods of nesting, wintering and breeding. Animal populations displaced from an area can be eventually replaced from surrounding ranges provided the habitat remains intact. Destruction of the habitat might preclude repopulation for extended periods. There have been instances of wildlife migrating out of an oil and gas field but eventually becoming accustomed to the disruptions and moving back. Unless proper precautions were taken, both mammals and birds may be poisoned by watering from the mud pits or streams contaminated by leaks and spills that may contain toxic fluids. Mud pits might also trap some animals. The impact on livestock may also be significant if the operations are conducted during the normal grazing season. Like some forms of wildlife, livestock have a low tolerance for noise and may avoid it by vacating the area.

The greatest potential for impact is on the human environment. Although in this report the developmental and production stages are being considered separately, they would occur simultaneously as the developmental stage progresses. Production requires many more workers depending on the size of the field being developed. The story of Farmington, New Mexico, shows how an oil and gas development may affect a small rural area. Although the area of the oil and gas field, the San Juan Basin, is 10 times the size of what could be expected in Harney County, the overall effects could be similar.

Farmington, lying in the center of New Mexico's San Juan Basin, was based on a stable rural economy (ranching, farming, forestry). Then came the discovery of oil and gas and its associated influx of people. The town grew from 3,573 in 1950 to 30,000 before 1960. The population density of the county increased from 3 to 10 persons per square mile. The numbers of residences increased from 700 in 1950 to 7,535 in 1959. By 1955, one billion dollars had been invested in oil and gas within the county. Several oil and gas companies and service industries set up offices in Farmington; four gasoline and two oil refineries were constructed. Although the oil reserves are gradually being depleted and less manpower is needed, the area does have coal and natural gas resources to sustain the economy of the region. The Farmington example illustrates the rapid growth associated with an oil and gas development.

The situation could be similar in the Burns-Hines area depending on the extent of oil and gas field and the rate of development. Regardless of the life span of an oil and gas field, which may be from 10 to 50 years, initial discovery and development results in a large influx of people and expenditures of large amounts of capital.

Like Farmington, Burns-Hines is based on a stable rural economy. Sudden growth from such development could alter local social and political systems, values, and lifestyles. As mentioned in the section on attitudes and expectaions, Harney County residents place a high value on

an established, stable, historically tradional lifestyle. These local residents also probably would not derive direct economic benefit from oil and gas development. Drilling development, production and construction require a semi-skilled labor force not locally available. The introduction of an imported labor force composed of people from different backgrounds, sub-culture or lifestyles, might cause some tension.

It is estimated that local labor is used for 10 to 15 percent of the field crew employment. It is also normal for companies to retain these local employees during development and train them for production phases. Service and trade sectors of the local economy immediately inflate, creating secondary employment in the wholesale and retail trade. Thus, an oil and gas development would have a beneficial effect on local employment, particularly in an area of high unemployment. But the opportunities generally cease once the field is abandoned.

The influx of money and new inhabitants could improve the economic level and cultural amenities of the community. New homes, hospitals, schools, churches, etc., might be built. New culture horizons might be introduced by the influx of "outsiders" who bring in new philosophies, interests, and organizations, and may demand theatres and museums. These benefits would remain long after the oil boom is over.

Discovery and development would put a burden on local government's ability to finance public services. Police and fire protection, medical facilities, and municipal sewer and water systems might be overloaded. Very typically, sufficient additional services are not provided fast enough and the quality of services for all may suffer initially.

When an oil and gas field is abandoned and if the economic base is not diversified some out-migration can be expected. When local governments have provided services and facilities to meet demands during the development and production phases, there is a possibility that they have over-anticipated long range needs of the community. Greatest impact would take place when (1) substantial out-migration takes place and (2) local governments are indebted to pay for facilities no longer needed.

Development of an oil and gas field would introduce a land use that is locally intensive; population influx and economic activity creates a demand for residential and commercial land uses. Effective local comprehensive land use planning can guide these uses in an orderly and controlled manner.

One beneficial effect of oil and gas production is that a portion of the royalties and rents received from the operation go to the state. The Federal government return 37.5 percent of the bonuses, rents, and royalties received from Federal oil and gas leases to the state; and the state allocates the money to the counties from which the revenue was derived.

Many of these impacts would occur during the developmental phase and early production phase of the operation. Both beneficial and adverse effects can be expected, but with proper planning some of the adverse effects may be allayed.

## Production

Much of this phase involves construction of facilities like those illustrated in Figure 3; roads, pipelines and wellhead equipment are also built. As previously mentioned, the impacts associated with these construction activities are noise, air pollution, soil erosion, vegetation destruction, and possible decrease in water quality.

Newly constructed facilities would also create a visual impact on the area, especially when they are located on skylines or in open, treeless areas.

With the additional wellhead equipment, pipelines, and storage facilities, the chances of spills or leaks become greater. More wildlife habitat, open space, recreational, and timber and/or grazing lands would be affected.

## Abandonment

This phase has the least impact upon the natural environment, but may have the most impact on the human environment. Unless the economic base is diverse enough so that people can find other jobs when the oil and gas reserves are depleted, there would be a substantial decrease in population. The additional revenues and tax base would be lost. All of these factors have been discussed in detail previously.

It might not be possible to reclaim the disturbed sites and restore them to their original condition. Erosion rates might be greater than they were before disturbance. If the mud pits were not properly reclaimed, they might be breached after field abandonment, or escaping fluids could lead to soil erosion and soil sterility. If wells were not cased and plugged properly the leaks could destroy additional habitat.

All of the facilities must be removed before abandonment. Because of the extra vehicle traffic, the soil would become compacted and possibly eroded, vegetation would be destroyed, and if the operation is during the summer months, dust would be a problem. If the sites are not revegetated properly, soil erosion would occur and water quality would decrease because of the increase in sediment load.

## POSSIBLE MITIGATING MEASURES

### Introduction

A tract of land is not offered for oil and gas leasing unless the environmental analysis indicates that the anticipated impacts as identified in the previous section, can be mitigated. The following section is a description of the methods that could be employed to reduce or alleviate those anticipated impacts.

### Preliminary Investigation

During a preliminary investigation, some dust would be created that may be alleviated by: (1) requiring operators to use existing roads whenever feasible, (2) permitting construction of roads of minimum width only when absolutely necessary, and (3) close and revegetate roads not needed after investigations are completed.

### Exploration and Development

These two phases of an oil and gas operation should be considered collectively in this portion of the analysis because the impacts associated with these two phases are similar, although the degree of impact is greater in the development phase. Thus, the possible mitigating measures for the exploration phase are also applicable in the development phase.

Construction of access roads and clearing of drilling sites could have a detrimental effect on soils and vegetation. Existing roads could be used as much as possible, new roads could be built only when necessary, and when they are built, culverts, perforated pipes and water bars could be installed to control drainage. Vegetation buffers could be required when roads are constructed near stream banks. If roads are to be used all year, the roads could be surfaced. These construction methods would also eliminate soil erosion and stream siltation. By limiting the number and dimensions of roads and drill sites, soil compaction and vegetation destruction would be minimized.

Cultural resource values would be directly impacted by any surface disturbance. Our knowledge of the cultural resource values in the lease area is incomplete. To alleviate the inadvertent destruction of the unknown cultural resources of the area, the lessee could be required to hire a certified archeologist to survey the area prior to surface disturbance. The purpose of the survey would be to disclose the existence of antiquities and other objects of interest.

In order to prevent land subsidence and possible structural damage, the fluids withdrawn during the drilling operation could be monitored and fluids reinjected when necessary.

To reduce the chances of a blowout, which results in a degradation of air quality, blowout preventers could be used. In addition, contingency plans could be developed in the event that a blowout and/or fire may occur.

Many types of fluids are produced or used during drilling that may damage the water, soil and vegetation. Measures to alleviate such damage include: (1) adequate well casing, (2) preventing blowouts, (3) locating wells away from streams, lakes, etc., (4) proper containment and reinjection of saline water into the producing formations, (5) proper construction of drilling mud pits, and (6) adequately sealing wells during abandonment. In some sensitive areas, secondary dikes could be constructed around drilling sites to contain any toxic fluids in case of a blowout. Wells could be cased and properly sealed to prevent contamination of ground water aquifers.

Land use conflicts can be best resolved by comprehensive local and regional land use planning and the adoption of effective land use controls before leasing takes place. To alleviate the impact on the communities, advance information as to the development possibilities would allow local officials the lead time to plan for increased community development in case oil and gas development becomes a reality. Economic instability could be alleviated somewhat by local officials understanding the uncertainty and finite nature of an oil and gas development. Some of the more traditional land uses in the area, such as livestock grazing and industrial forest management can reasonably coexist with oil and gas operations. Impacts on these land uses can be mitigated by employing the erosion control and water quality protection measures previously discussed.

Many of these erosion control and water quality protection measures could also reduce the adverse impacts on wildlife. In order to protect wildlife values, operations could be curtailed during the cruicial periods of resting, wintering and breeding. Fences could be built around mud pits to prevent animals from falling in.

## Production

Many of the construction methods and preventive measures previously discussed are also applicable to the production phase. However, additional measures need to be considered.

Holding tanks and other storage areas could be surrounded by impermeable dikes and berms to catch oil in the event of a blowout. Spilled oil from storage areas and pipelines could be cleaned up immediately to reduce the possibility of water pollution.

Careful planning of roads, pieplines and storage areas would eliminate unnecessary roads, reduce soil disturbance and visual impacts.

To further reduce visual impacts, pipelines, storage tanks, etc., could be painted in order to be more harmonious with the surrounding landscape.

## Abandonment

During abandonment of a field, drilling pads, well sites, storage sites, roads, etc., could be ripped and revegetated as soon as oil structures are removed. If any area shows evidence of soil compaction, the area could be ripped and revegetated. Reclamation of abandoned well sites and producing fields could include revegetation of disturbed areas with plant and grass species beneficial to wildlife. Mud pits could be allowed to dry before the pit is filled in and graded to as near the original surface as possible and replanted. Abandoned wells could be sealed as required by the U. S. Geological Survey and the State of Oregon Regulations.

## Recommended Mitigating Measures

If the oil and gas leases are issued, the lessee must operate under the "Federal Oil and Gas Leasing Regulations" (Appendix B). The oil and gas lease must also comply with the requirements of the Environmental Protection Agency (EPA) for oil pollution prevention and the Council of Environmental Quality for national oil & hazardous substances pollution contingency plan (Appendix C).

All oil and gas leases contain a provision for protection of the environment (Appendix D). The lessee, upon signing the lease, shall agree to the following stipulations for the National Resource lands within the analysis area:

1. Activities employing wheeled or tracked vehicles shall be conducted in a manner suitable to the Authorized Officer and the Supervisor so as to minimize surface damage. Existing roads and trails shall be used whenever possible.

2. Operations within 600 feet or any surface waters or wet soil areas such as streams, springs, seeps, reservoirs or meadows, will be permitted only if specifically approved in writing by the Authorized Officer and the Supervisor.

3. Backfilling, final grading, revegetation and removal of surface supporting facilities shall be completed within one year after completion or termination of the particular operation involved, unless the Authorized Officer extends such time.

4. The Lessee shall construct and color all permanent installations in such a manner that they are harmonious and accentuating to the surrounding landscape.

5. Restricted access will be provided by the Lessee when specifically requested by the Authorized Officer and the Supervisor.

6. Prior to any operations under this lease, the Lessee will engage a qualified archeologist, acceptable to the Authorized Officer, to make an archeological survey of the land to be disturbed or occupied. A certified statement, signed by the qualified archeologist, setting out the steps taken in the survey and the findings thereof as to the existence of antiquities or other objects of historic or scientific interest, shall be submitted to the Authorized Officer. If the statement indicates the existence of such objects, which might be disturbed by operations under this lease, the Lessee shall take such steps as may be required by the Authorized Officer, including archeological salvage. The responsibility for the cost for the certificate, survey and salvage will be borne by the Lessee, and such salvage property shall remain the property of the Lessor or the surface owner.

   The Lessee shall immediately bring to the attention of the Authorized Officer any antiquities or other objects of historic or scientific value or interest, including but not limited to historic or prehistoric ruins, fossils or artifacts discovered as a result of operations under this lease and shall leave such discoveries intact. Failure to comply with any of the terms and conditions imposed by the Authorized Officer with regard to the preservation of antiquities may constitute a violation of the Antiquities Act (16 U.S.C. 431-433).

7. The Lessee shall contact the Authorized Officer prior to development of a plan of operation to be apprised of practices that should be followed or avoided in exploration or field development, including but not limited to such matters as road standards, road crossings, gates, cattleguards, fencing, erosion control, surface rehabilitation, reservoirs, wells and springs.

8. The Lessee will apply to the Authorized Officer for a tramroad right-of-way permit pursuant to 43 CFR 28811, over lands and roads owned or controlled by the BLM for the purpose of obtaining access to the leased area.

9. All access, haul and other support roads and trails shall be located, constructed and maintained in accordance with Bureau standards and specifications as required by the Authorized Officer. Roads constructed in rocky, highly erosive areas shall be constructed by placing the road base on top of the rocks.

In addition to these stipulations, all oil and gas leases issued contain an open ended set of stipulations (Appendix E). This form insures that after the lease is issued, the U. S. Geological Survey and the Bureau of Land Management, and the U. S. Fish and Wildlife in an advisory capacity, have additional opportunities to specify measures the lessee must take to protect environmental values during any of the four phases of the operation.

The State of Oregon also has jurisdiction over an oil and gas operation on Federal lands. The lessee must comply with the Department of Geology and Mineral Industries Regulations (Appendix F). If a lessee desires to drill an exploration well, he must also apply for a permit with the Department of Geology and Mineral Industries as well as the U. S. Geological Survey. The Department of Environmental Quality and the Department of Geology and Mineral Industries have agreed to 12 conditions (Appendix G) that may be made part of a state drilling permit. The Oregon Department of Fish and Wildlife also acts in an advisory capacity prior to the issuance of the permit.

## Residual Impacts

The oil and gas operating regulations, lease provisions, land use planning, permit reviews and other rules and regulations are designed to assure that oil and gas operations are conducted in an environmentally acceptable manner. In those instances where this cannot be done, development and use will not be permitted. Where the benefits of a proposed action outweigh acceptance of minor adverse impacts, such uses are acceptable provided the impacts have been identified and mitigated as much as possible. The following summarizes the type of adverse impacts that are unavoidable should the lease be issued and the operations go to completion.

One of the major impacts resulting from the proposed action that could not be avoided is the impact on the local communities. Even with land use planning and local community involvement, the local communities would be affected if the development phase were reached. A possible burden could be placed on community services to provide housing, schools, water and sewage facilities and health services depending on the size of the field and the rate of development. If the local economy did not diversify before the oil and gas field is abandoned, the impact would be even greater. However, the local communities would also derive some benefits from oil and gas development like new schools, roads and hospital facilities.

Another major impact that is unavoidable is changing the character of the land from its presnt use to industrial use. Some of the visual impacts can be lessened by burying pipelines, painting structures a more harmonious color, etc. Nonetheless, man's activities will lessen the area's aesthetic values.

Like any construction activity, some noise, dust and engine exhausts cannot be avoided. Because of the noise and intrusion of activity, some wildlife will be displaced. Recreational activities will also be displaced because of the potential safety hazards.

Most of these residual impacts are temporary; they will last only as long as the oil and gas field is producing. Once the field is abandoned

and the area is restored to its original character as much as possible, the impacts will be eliminated. The only impact that cannot be eliminated once the operations have ceased is the impact on the county and local communities. The changes brought about by oil and gas development on the local communities will be permanent.

## RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

### Introduction

This section focuses on the relationship between the short-term use of the environment for oil and gas operations and the long-term productivity and maintenance of the environment for other uses such as wildlife, recreation and grazing.

Short-term use refers to the period during which oil and gas operations would take place. The duration may vary from a period of several months, if wildcat drilling were unsuccessful, to 50 years if commercial amount of oil and gas were discovered. Long-term use includes the period following all possible restoration, after the abandonment of the oil and gas lease.

### General

Leasing lands for oil and gas development involves the commitment of oil and gas resources and resources of the site(s) involved. Some uses, such as grazing, can co-exist with most oil and gas operations.

The purposes of the exploration and testing phases of oil and gas leasing are to determine the nature and extent of oil and gas resources. The active portion of this phase is short, sometimes lasting for only days or months. It may be intensive and continuous for a short time. When exploration proves unsuccessful, there will not be subsequent use of the land for development and production of oil and gas. Such leases will terminate at the end of the 10 year primary term, or in many instances, be relinquished at an earlier date so the company can avoid additional lease payment costs. Exploration and lease provisions will require that lands disturbed by unsuccessful exploration will be restored as nearly as possible to their original condition. Restoration includes measures such as grading, installing proper drainage, soil stabilization, revegetation, disposal of all wastes, filling of holding ponds, etc. Except for scars from roads or other earth movement, the areas should soon return to natural conditions. Changes in vegetative cover may result, depending upon whether native or non-native plants are used. Generally, the native vegetation will eventually re-establish, but on some sites recovery may be slow.

If exploration reveals oil and gas in commercial quantities, development and production will begin. But before this occurs, an Environmental Impact Statement may be necessary. The life of the field is generally from 10 to 50 years. When the reservoir can no longer sustain the field, the facilities will be dismantled, the land restored to its original condition as far as possible, and the leases terminated. Most of the area involved will by then have become well stabilized except for sites used for storage and collection, roads or other structures or

facilities. Disturbance from removal of these improvements will be of temporary nature and subject to restoration. The combination of restoration and natural vegetative recovery will, over time, result in a near natural setting, with only some contour change as evidence of prior uses. The lands will return to their former productivity or will be available for other appropriate uses.

### Oil and Gas Resources

By developing oil and gas reserves, a previously untapped resource could be utilized to meet the nation's energy demand. The contribution would be small in terms of total energy requirements, but could be important on a regional or local basis.

### Water

Water is used for drilling in such small amounts that it would not jeopardize local water supplies. Under the proposed controls and stipulations for waste water disposal, degradation of surface waters and ground water aquifers would not be significant in the long-term mishaps and accidents may have serious short-term impacts, but corrective measures should prevent long-term adverse effects on the water resource.

### Land

Land uses during the period of operations would change from wildlife habitat, recreation, etc., to industrial operations. Some prior uses, although they may be reduced, are compatible with development and production. Public access would be restricted to protect the public and facilities. Development and production activities are not expected to have any lasting or inhibiting effects on the use of the land after oil and gas operations have ended and the facilities have been removed.

### Wildlife and Recreation

Development of oil and gas may cause localized adverse impacts on wildlife by displacement of wildlife and altering the habitat. Restrictions of public access will reduce hunting and related recreational opportunities in the vicinity of installations.

### Economic and Social

Oil and gas development, including drilling wells and constructing roads, pipelines, and storage facilities, requires substantial capital investment. Such investments create an increased tax base for the development area. However, the labor-intensive phase may be short-term and would result in significant changes in population distribution, economic structure and social character, but if the economic base is diversified before abandonment begins, the impacts will be short-term.

## Irreversible and Irretrievable Commitments

The principal commitment is the non-renewable oil and gas resource. Other irreversible and irretrievable commitments of resources that may occur as a result of development are:

1. The removal of oil, gas and brines can cause land subsidence.
2. Roads and plant sites may not be returned to their original conditions.
3. Eroded soils cannot be replaced.
4. Plants which may be removed may not be replaced by the original species.
5. Archeological sites are a fragile resource. If a site is disturbed or destroyed, the scientific information it could have yielded cannot be replaced.

## PERSONS, GROUPS AND GOVERNMENT AGENCIES CONSULTED

Appendix H is a list of people and agencies consulted on the proposed action and the Environmental Analysis Report.

## INTENSITY OF PUBLIC INTEREST

Letters were sent to interested parties and a news release was printed in the Burns-Times Herald (Appendix H). From the letters we received, the interest can be described as "concerned" to "disinterested" (Appendix H).

Some groups are concerned with the conflicts that might arise as a result of the proposed action. Others stated that the effects of the proposed action would be acceptable. Of the many letters sent, only a small number responded, indicating a lack of interest.

On February 19, 1976, a program depicting an oil and gas operation was shown to 10 persons of the local Kiwanis Club in Burns, Oregon. The comments received from this local service group of professional people, businessmen and local government officials were generally favorable. They considered visual impact and surface disturbance as being so limited in a real extent to be insignificant. Another person commented that if the operation was conducted properly, it would be fine, but if not, as he had observed in some of his past experiences, then he would rather not have oil and gas leasing.

## PARTICIPATING STAFF

The Environmental Analysis Report was prepared in the Burns District, Bureau of Land Management by:

Willard Phillips, Drewsey Area Manager, BLM
Guy Sheeter, Wildlife Biologist, BLM
Jim Scheidt, Soils Scientist, BLM
Ruth McGilvra, Archeologist, BLM
Dick Miller, Realty Specialist, BLM
Bob Pulfrey, Geologist, BLM
Richard Old, Taxonomist, BLM

## SUMMARY CONCLUSIONS

The dominating factors reflected in the analysis are summarized in the following paragraphs.

As statistics have shown, it is unlikely that the operation will go beyond the exploration phase. The small acreage affected by the exploration effort will be restored to the original state as much as possible. Thus, the proposed action of the leasing of lands for oil and gas will have little impact on the long-term productivity.

Even if exploration is successful and development occurs, no major environmental impacts are anticipated, provided that the lessee adheres to the recommended mitigating measures, rules, and regulations. The development could have both substantial benefits and adverse effects on the local communities. However, if there is insufficient planning and coordination, the impact on the local communities could be significant.

Although the probability of accidents in an oil and gas leasing program are remote, the potential environmental impacts resulting from oil spills, well blowouts, land subsidence, fires, and well casing leaks can be considered significant. At the same time, the operation could provide a much needed resource.

# APPENDIX A

## STATEWIDE OVERVIEW OF POSSIBLE OIL AND GAS DEVELOPMENT ON FEDERAL LAND IN OREGON

# STATEWIDE OVERVIEW OF POSSIBLE DEVELOPMENT ON FEDERAL OIL AND GAS LEASES IN OREGON

## Introduction

This appendix is an overview of the development which could occur on Federal oil and gas leases in Oregon. The number and location of leases and pending applications in the State are described; and the possible levels of ensuing oil and gas exploration and production activities are considered.

The anticipated environmental effects of exploration and production activities are analyzed in the main body of environmental analysis records prepared for individual blocks of lease applications.

If commercial quantities of oil or gas are found in the State, transportation facilities would be required; and discoveries of oil could lead to the construction or enlargement of refineries. Analysis of the environmental effects of transportation and refining facilities is beyond the scope of the environmental analyses of the lease applications. However, the potential for, and possible magnitude of, pipeline and refinery construction are examined in this appendix. The principal environmental permit and certification processes required of proposed pipeline and refinery projects in Oregon are also described.

As of February 9, 1976, 212 applications for Federal oil and gas leases were on file in Oregon. The applications covered 387,636 acres. In addition, 193,467 acres were already under lease. The total area included in both existing leases and pending applications was 581,103 acres. Areas containing Federal leases and pending lease applications in Oregon are shown in Figure 1.

## Exploratory Drilling

If pending lease applications were approved, at least four or five exploratory wells probably would be drilled on Federal or intermingled private or State land during the next several years. If early tests were favorable, 20 or more wildcat wells might be drilled on lease blocks containing Federal lands.

Many Federal oil and gas leases expire without being explored for oil and gas. This is particularly true outside areas classified by the U.S. Geological Survey as known geologic structures. Since there are no known geologic structures in Oregon, exploratory oil and gas wells probably would be drilled on a relatively small percentage of the leases during the next several years. If oil or gas were discovered, additional exploratory wells would be drilled.

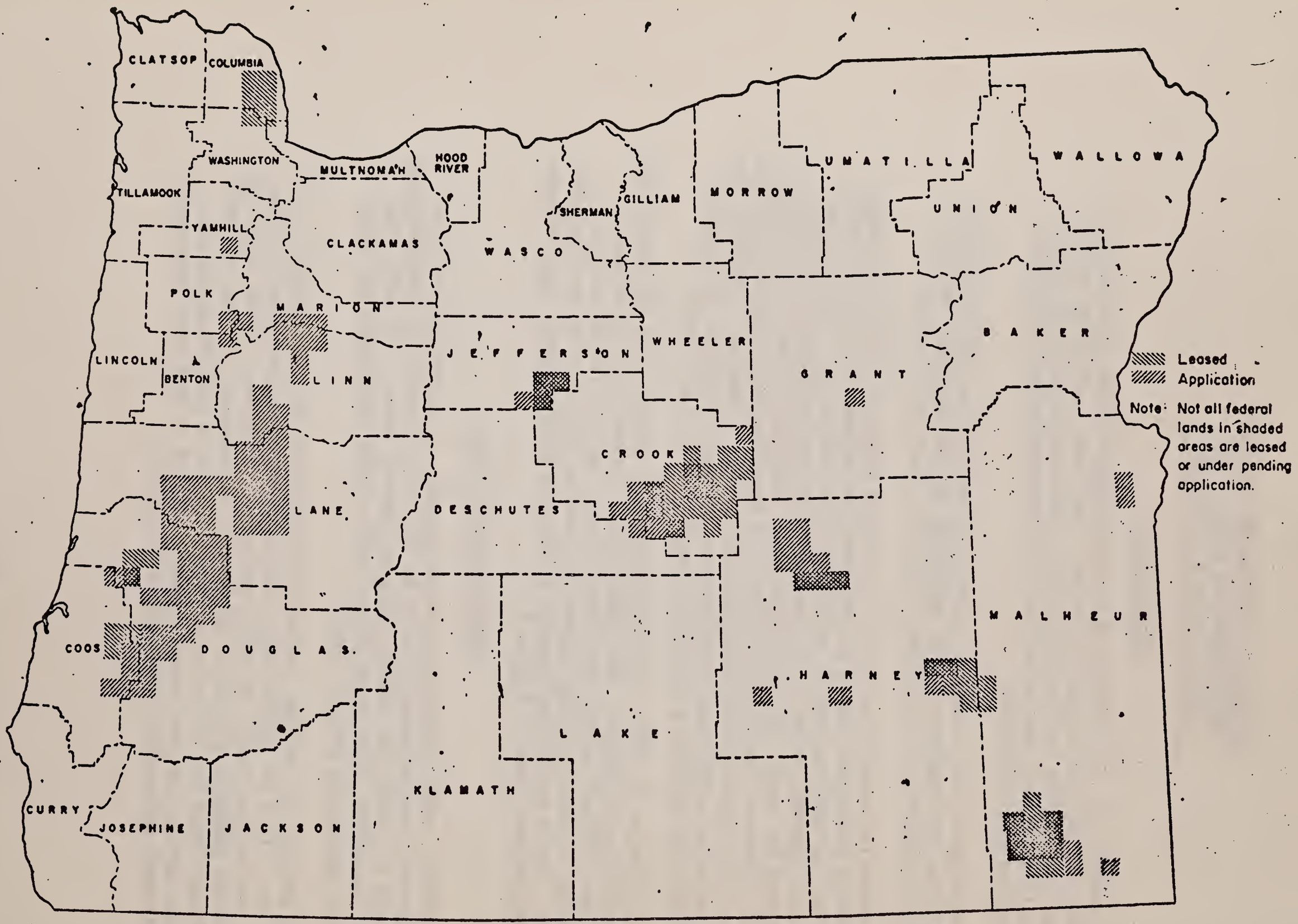



FIGURE 1 Areas containing Federal Oil and Gas Leases and Pending Applicotion for Federal Oil and Gas Leases in Oregon, as of February 9, 1976.

The petroleum industry's interest in exploration for oil and gas in Oregon has fluctuated over the years, but it now appears to be increasing. One indication of industry interest in the State is the acreage of Federal oil and gas leases. The total area included in Federal leases in Oregon dropped from a peak of 1,079,740 acres in 1956 to 22,892 acres in 1967. Since 1967, the acreage leased or under application has risen steadily; in early 1976, it stood at 581,103 acres. Oil companies also were reported to be leasing substantial areas of private land in 1975 and early 1976, particularly in the Willamette Valley.

Exploration activities increased in the State in 1975, and it appears that the momentum will extend at least through the next two to three years. Mobil Oil, the major applicant for Federal leases in western Oregon, conducted geophysical and gecchemical sampling surveys in the State. Reichold Energy Corporation and Northwest Natural Gas Company drilled four dry holes in western Oregon in 1975 in search of natural gas.

The number and location of lease and lease application blocks provide a general indication of the number and location of exploratory wells which might be drilled during the next several years. Identification of lease blocks in some areas is complicated by the intermingling of leaseholds and lease applications of two or more companies. However, there appear to be about 15 lease or lease application blocks on Federal lands in the State at the present time.

If the first well drilled in a lease block is unsuccessful, it might be the only well drilled in the block during the current cycle of exploratory activity. Many years may pass before the current or a succeeding lessee concludes that another well is warranted. Wells might not be drilled in some blocks if exploration of nearby blocks is unsuccessful. Other blocks might remain unexplored because of the inability of the lessee to secure financing for a drilling operation. In a large block held by a large company, two or more dry holes might be drilled before drilling operations are stopped.

Almost all of the pending lease applications for Federal lands in western Oregon were filed by Mobil Oil; and if a significant portion of the applications is approved, it is likely that more than one exploratory well will be drilled in the company's large lease block. A petroleum engineer for the Oregon Department of Geology and Mineral Industries believes that the company is planning to drill several deep test holes in the next two to three years. (1)

Approximately one acre is required for the drill pad for an exploratory well. Somewhat more land would be needed on sloping land. On a well-per-well basis, more land might be disturbed in the construction of drill pads in western than in eastern Oregon. Because of the road system already developed to harvest timber and the cost of road construction in steep terrain, most wildcat wells in western Oregon probably would be drilled in locations which minimize the need for temporary access roads. In eastern Oregon, wildcat wells would be more likely to require the construction of access roads.

## Oil and Gas Production

Recent experience of the oil and gas industry in the United States may provide a general indication of the possible outcome of oil and gas exploration in Oregon. As indicated in Table 1, the chances of discovering a significant recoverable reserve of oil or gas in the nation in 1974 were approximately 1 in every 59 new-field wildcat wells drilled. When a significant discovery was made in 1974, the odds were greater than 9 to 1 that the area of the field would be less than 2 square miles.

TABLE 1

NEW-FIELD WILDCAT WELLS DRILLED IN U.S. IN 1974:
NUMBER AND PERCENT OF DRY HOLES
AND PRODUCERS BY CLASS OF OIL AND GAS FIELD

| Class of Field 3/ | Total Recoverable 3/ Reserves by Field Class | | Area of Oil Fields 1/ | | Number and Percent of 2/ New-Field Wildcats Drilled in 1974, by Field Class | |
|---|---|---|---|---|---|---|
| | Oil (Mill.Brls.) | Gas (Bill.Cu.Ft.) | Denver-Julesburg Basin. Co. (Sq. Mi.) | California (Sq. Mi.) | Number | Percent |
| I. Producers | | | | | 805 | 14.24 |
| A. Significant | | | | | (96) | (1.70) |
| A | +50 | +300 | -- | -- | 0 | 0 |
| B | 25-50 | 150-300 | 9.7 | 1.7 | 1 | 0.02 |
| C | 10-25 | 60-150 | 5.2 | 1.1 | 7 | 0.12 |
| D | 1-10 | 6-60 | 1.4 | 0.4 | 88 | 1.56 |
| B. Not Significant | | | | | | |
| E | Less than 1 | Less than 6 | 0.6 | 0.2 | 707 | 12.51 |
| F | Abandoned | | | | 2 | 0.3 |
| II. Dry Holes | | | | | 4847 | 85.76 |
| Total New-Field Wildcats Drilled in U.S. in 1974 | | | | | 5652 | 100.00 |

1/ H. W. Menard and G. Sharmen. 1975. "Scientific Uses of Random Drilling Models." Science. Vol. 190, No. 4212.

2/ F. J. Wagner, 1975. "North American Drilling Activity in 1974." Bulletin of the American Association of Petroleum Geologists. Vol. 58, 1273.

3/ Field classifications and "significance" criteria established by American Association of Petroleum Geologists.

All of the 189 oil and gas wells drilled in Oregon since 1902 have been dry holes. In the opinion of the staff of the Oregon Department of Geology and Mineral Industries, however, "There is still potential for finding deposits of oil and gas in Oregon in spite of many past drilling failures . . . . Results of deep drilling have been generally discouraging, but they have shown that there is a thick section of marine sedimentary rocks and that at many locations porous and permeable sands exist within the stratigraphic section." (2) Past drilling in the State has produced numerous shows of oil and gas, but none has been in commercial quantities.

One indication of the chances of discovering commercial quantities of oil and gas in Oregon may be the discovery rate for all new-field wildcat wells in the country. As indicated in Table 1, of the 5652 new-field wildcat wells drilled in the United States in 1974, 805--or one in seven--were finished as producers. However, only 96--or one in 59--resulted in the discovery of fields with significant recoverable reserves.(3) The American Association of Petroleum Geologists considers significant reserves to be those over one million barrels, the amount required to meet the country's petroleum demand for one and one-half hours. The percentage of significant oil or gas finds in total new-field wildcat wells drilled in the United States declined from over three percent in the late 1940's to 1.7 percent in 1974.(4)

Recent drilling experience also provides an indication of the size of field most likely to be discovered. Over the years, a growing percentage of the significant discoveries has been in smaller fields. In the late 1940's, 20 to 25 percent of the significant oil and gas discoveries were in Class "D" fields, the smallest fields in the American Association of Petroleum Geologists' rankings.(5) As indicated in Table 1, 88 of the 96 significant new-field discoveries in 1974, or 92 percent, were in Class "D" fields. From 1968 to 1974, 84 percent of the signficant discoveries were in Class "D" fields.

Table 1 also relates classes of oil and gas fields, as determined by total recoverable reserves, to the area of oil fields in Colorado and California. Class "D" fields average approximately one-half square mile in California and one and one-half square miles in the Denver-Julesburg Basin in Colorado. The average sizes of the fields in each class in the Denver-Julesburg Basin approximate those for the nation as a whole.(6)

It appears, therefore, that if oil or gas is found in Oregon, the chances are better than even that the field will be less than two square miles in size.

The American Association of Petroleum Geologists refers to Class "A" oil and gas fields as "giants." From 1968 to 1974, only 3.1 percent of the significant discoveries in the United States was in giant fields. No giant fields were discovered in the country in 1973 and 1974 (1975 data are not available).(7) Although the chances of a giant field being discovered in Oregon are probably slight, the possibility remains. Examples of large

oil fields in California include the 46-square mile Midway Sunset and 60-square mile Elk Hills fields. The Rio Vista and Sutter Buttes fields are large gas fields in California; both are approximately one square township, or 36 square miles, in area.(8)

The amount of land used in a field for roads, well sites, and other oil and gas field facilities depends largely upon the well spacing pattern. Gas wells tend to be more widely spaced than oil wells. Typical spacing patterns in recently developed fields in California are 10 acres per well in oil fields and 160 acres per well in gas fields.(9) In the Rocky Mountain area, spacing patterns range from 40 to 160 acres per well in most oil fields developed in recent years and from 160 to 640 acres per well in gas fields.(10)

The administrative rules of the Oregon Department of Geology and Mineral Industries require a minimum spacing pattern of 40 acres per well unless a different spacing pattern is approved by the department's governing board.

With a 40-acre-per-well spacing pattern, approximately 12.8 acres per square mile may be used for well sites, roads, and other facilities; with a 320-acre-per-well spacing pattern, about 6.4 acres per square mile may be used.

If a small, two-square mile field is discovered in Oregon, the amount of land used in the field may range from approximately 13 to more than 25 acres. If a large, 50-square mile field is discovered, more than 640 acres may be used for roads, well sites, and other facilities.

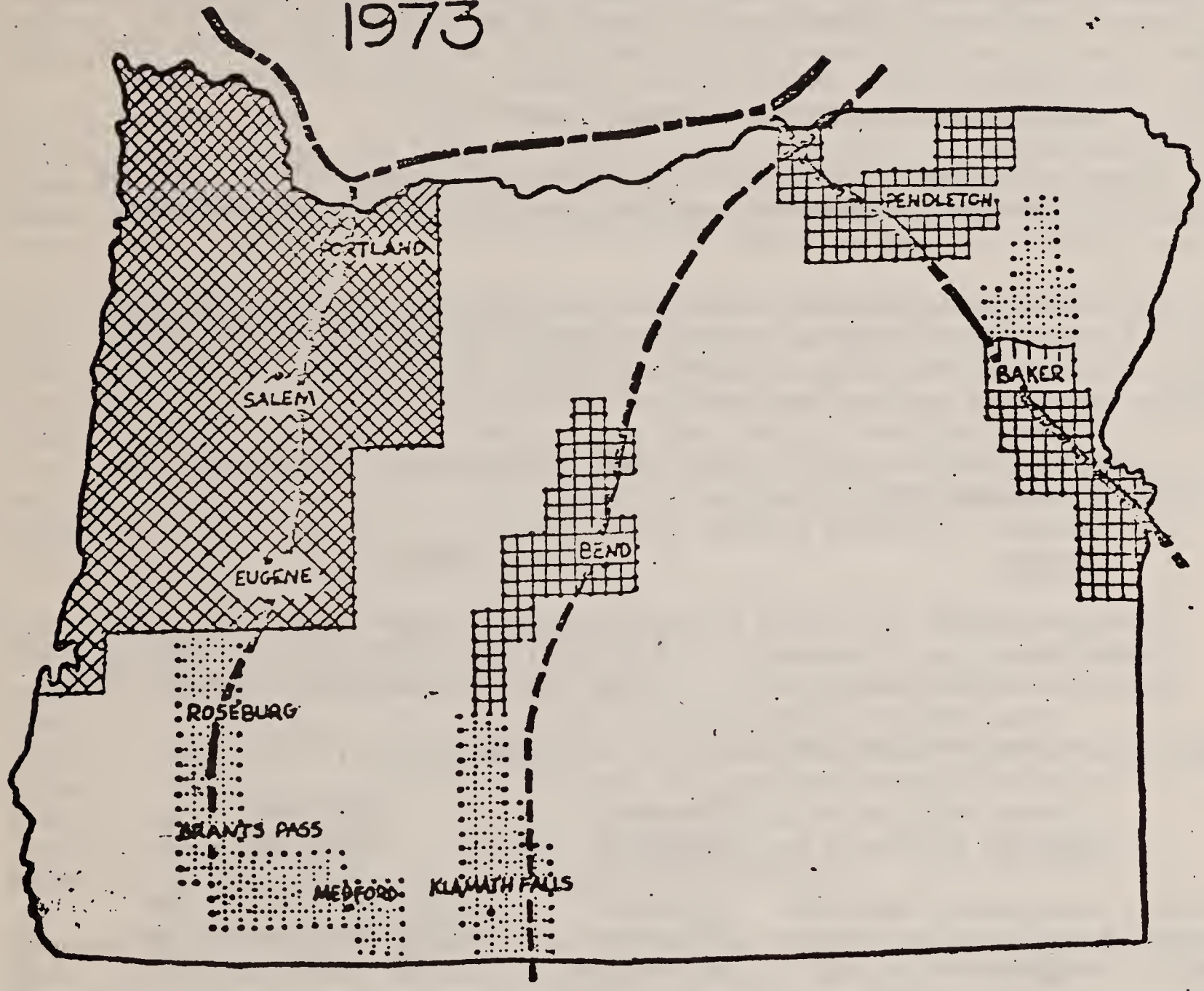
## Transportation and Refining Facilities

If commercial quantities of natural gas were discovered in Oregon, it probably would be sold to natural gas utilities with marketing areas or pipelines in the vicinity of the gas fields. The boundaries of Oregon's natural gas utility districts and major pipeline routes are shown in Figure 2. (The West Coast leg of the proposed Alaska Natural Gas Transportation System natural gas pipeline would parallel all but 21.4 miles of the existing Pacific Gas Transmission Company route shown on the map). Except for those in southeastern Oregon, the lease and lease application blocks are located within a relatively short distance of major existing natural gas pipelines.

If the route of a proposed gas pipeline crossed Federal lands, the land-administering agency would prepare an environmental assessment or analysis record before issuing a right-of-way. (The environmental impacts of flowlines--as distinct from pipelines--constructed on the leasehold to carry gas from the wellhead to a central collection point would be analyzed by the U.S. Geological Survey and the land-administering agency after the lessee submitted a proposed surface use plan for the leasehold.) If anticipated environmental impacts of the proposed pipeline or public interest were determined to be significant, an environmental impact statement would be prepared.

FIGURE 2

# OREGON NATURAL GAS UTILITY DISTRICTS & PIPELINES 1973




SOURCE: Oregon Office of Energy Research and Planning, Transition: A Report to the Oregon Energy Council. January 1, 1975.

In 1975, the Oregon Legislature passed legislation requiring proponents of natural gas pipelines 16 inches or greater in diameter and 5 miles or longer in length to obtain a site certificate from the Oregon Energy Facility Siting Council. The certificate is to contain conditions "for ... the protection of public health and safety." The council is authorized to commission a study of "any aspect of the proposed energy facility."(11) The Oregon Department of Energy, the Council's administrative arm, published draft site certificate application rules for pipelines in February 1976. The proposed rules would require pipeline proponents to describe the environmental impacts of the proposed pipeline.

The Office of Pipeline Safety, U.S. Department of Transportation, and the Oregon Public Utility Commission regulate the construction and operation of gas pipelines to insure safety standards are met.

Oil produced on Federal leases in Oregon could be refined (a) within the State at existing refineries, refineries now being planned, or refineries built specifically to refine crude oil produced in the State; or (b) in neighboring states such as California or Washington.

At the present time, there are three small refineries in Oregon; all are located in Portland (12):

| Company | Capacity |
|---|---|
| Chevron Asphalt | 18,000 barrels asphalt per day |
| Nu-Way Oil | 2,000 barrels lubricants per day |
| Ager & Davis Refining | 3,500 barrels mixed grade oil per day |

Plans have been ammounced for three new refineries in the State (13):

| Company | Proposed Location | Proposed Capacity |
|---|---|---|
| Columbia Independent Refiners | Portland | 50,000 barrels per day |
| Cascade Energy | Rainier | 30,000 barrels per day |
| Charter Energy | St. Helens | 52,400 barrels per day |

If oil were produced in Oregon, it might replace some of the feed stocks which the new refineries would otherwise have to import from outside the State.

If oil produced in Oregon were not refined within the State, it probably would be transported either to refineries in the Puget Sound area in Washington or to California. At present, about 60 percent of the petroleum products consumed in Oregon are refined in the Puget Sound area.(14)

Unlike natural gas, many miles of new pipeline might be constructed to transport oil produced in the State. There are two petroleum product pipelines but no crude oil pipelines in the State. Other transportation modes might also be used.

The site certification process cited previously for natural gas pipelines in Oregon also applies to crude oil and petroleum product pipelines six inches or greater in diameter and five miles or longer in length. If a proposed petroleum pipeline crossed Federal lands, the environmental impacts of the pipeline would be assessed by the land-administering agency.

At the present time, the Oregon Energy Facility Siting Council's site certification process for energy facilities does not apply to refineries.(15) However, before a refinery could be built in Oregon, air contaminant and waste discharge permits would be required from the Oregon Department of Environmental Quality.

Air Contaminant Discharge Permit: In addition to requiring the permit applicant to limit emissions to levels stipulated in State regulations, the State permit also is used to implement the U.S. Environmental Protection Agency's regulations in Title 40, Code of Federal Regulations, Part 60, "Standards of Performance for Certain New Stationery Sources." Performance standards for particulate matter, carbon monoxide, and sulfur dioxide emissions from petroleum refineries are included in Subpart A of the Federal regulations and in Section 25-000.70, Chapter 340 of the Oregon Administrative Rules.

Waste Discharge Permit: Waste discharge permits prescribe limitations on the discharge of wastes into public waters or elsewhere into the environment in a manner that may affect the quality of public waters. If discharges into navigable waters are proposed, the State's permit also serves as the permit required under the U.S. Environmental Protection Agency's regulations in 40 CFR 125 on the National Pollutant Discharge Elimination System. Permits for refineries are based on State water quality standards and EPA's Effluent Guidelines and Standards for Petroleum Refining Point Source Category (40 CFR 419).

Proponents of a refinery probably would also be required to prepare a Spill Prevention Control and Countermeasure Plan. The Environmental Protection Agency's regulations on "Oil Pollution Prevention in Non-Transportation Related Onshore and Offshore Facilities (40 CFR 112) require such a plan for non-transportation related facilities ". . . that have discharged or could reasonably be expected to discharge oil in harmful quantities, as defined in 40 CFR Part 110, into or upon the navigable waters of the United States or adjoining shorelines. . . ." Most refineries probably would be located at sites where there would be a reasonable expectation that harmful quantities of oil could be discharged.

## References


1. Vernon C. Newton, Jr., 1976. "Oil and Gas Exploration in 1975." The Ore Bin. Oregon Department of Geology and Mineral Industries. Vol. 38, No. 1, 609.

2. _____. 1974. "Oil and Gas Exploration in 1973." The Ore Bin. Oregon Department of Geology and Mineral Industries. Vol. 36, No. 1, 4-8.

3. F. J. Wagner. 1975. "North American Drilling Activity in 1974." Bulletin of the American Association of Petroleum Geologists. Vol. 58, 1273.

4. Ibid.

5. Ibid.

6. H. W. Menard and G. Sharman. 1975. "Scientific Uses of Random Drilling Models." Science. Vol. 190, No. 4212.

7. Op. cit.

8. Personal communication, William Lee, Conservation Division, U.S. Geological Survey, Menlo Park, CA.

9. Personal communication, John Fackler, Conservation Division, U.S. Geological Survey, Los Angeles, CA.

10. Personal communication, Wally Sutherland, Conservation Division, U.S. Geological Survey, DEnver, CO.

11. Oregon Revised Statutes 453.355.

12. Personal communication, Vernon Newton, Oregon Department of Geology and Mineral Industries, Portland, OR.

13. Ibid.

14. Oregon Office of Energy Research and Planning. 1975. Transition: A Report to the Oregon Energy Council. p. 55.

15. Personal communication, W. R. Vermeere, Oregon Department of Energy, Salem, OR.

APPENDIX B

U. S. GEOLOGICAL SURVEY

and

BUREAU OF LAND MANAGEMENT

OIL AND GAS OPERATING REGULATIONS

Pages B-1 thru B-23 are NOT INCLUDED

These pages are reproductions from the Code of Federal Regulations (CFR) text which is a matter of public record. The omitted portions consist of the following CFR sections:

1. Geological Survey Regulations
   30 CFR 221 Oil & Gas Operating Regulations
   30 CFR 223 Approval of Sales Agreements or Contracts covering the Disposal of Oil & Gas Lease Products.

2. Bureau of Land Management
   43 CFR 3100, Oil & Gas Leasing

granted by the Secretary of the Interior in the interest of conservation. The relief authorized under this section may also be obtained for any oil and gas leases included within an approved unit or cooperative plan of development and operation.

*****

Office of the Secretary

[Order 2583, Amdt. 8]

BUREAU OF LAND MANAGEMENT

DELEGATION OF AUTHORITY IN CONNECTION WITH LANDS AND RESOURCES

AUGUST 11, 1952.

Order No. 2583 is amended as follows:

PART 2—AUTHORITY IN SPECIFIED MATTERS

MINERALS

1. Section 2.41 is amended to read:

SEC. 2.41 *Mineral leasing; relief and suspensions.* With the concurrence of the Director Geological Survey, the waiver, suspension, or reduction of the rental or minimum royalty or the reduction of the royalty on an entire leasehold, or on any deposit, tract, or portion thereof segregated for royalty purposes.

JOEL D. WOLFSOHN,
*Acting Secretary of the Interior.*

[F. R. Doc. 52-9023; Filed, Aug. 15, 1952; 8:45 a. m.]

---

Office of the Secretary

GEOLOGICAL SURVEY

Delegation of Authority

The following material is a portion of the Departmental Manual and the numbering system is that of the Manual.

PART 220—GEOLOGICAL SURVEY

CHAPTER 4—MINERAL LEASING FUNCTIONS

220.4.1 *Delegation of authority.*

A. Functions relating to unit agreements. The Director, Geological Survey, the Interior under the Mineral Leasing Act of February 25, 1920, (41 Stat. 437) as amended (30 U.S.C., 181 et. seq.) to approve, in the interest of conservation, agreements which provide for cooperative or unit plans of development or operation.

*B. Functions relating to claimed discoveries of new oil or gas deposits.* The Director, Geological Survey, is authorized to act on applications for royalty benefits by reason of a claimed discovery of a new oil or gas deposit under the Act of August 8, 1946 (60 Stat. 950), and to determine whether a new oil or gas deposit has been discovered, and the effective date of such discovery.

*C. Determination of productive limits of a producing oil or gas deposit.* The Director, Geological Survey, is authorized to determine under the Act of August 8, 1946 (60 Stat. 950), the productive limits of a producing oil or gas deposit, as such limits existed on August 8, 1946, on his own initiative or on application by the holder of an oil and gas lease or his operator.

*D. Approval of crude oil exchange agreements.* The Director, Geological Survey, is authorized to give final approval to agreements providing for the exchange of crude oil purchased under the Act of July 13, 1946. (60 Stat. 533), and the regulations thereunder, 30 CFR 225.1 et seq., for other crude oil.

*E. Approval of communitization or drilling agreements.* The Director, Geological Survey, is authorized to give final approval to communitization or drilling agreements submitted for approval in accordance with 43 CFR 3121.3. The Director has redelegated to the regional oil and gas supervisors the authority delegated by this paragraph (27 F.R. 6395).

*F. Suspension of operations and production.* The Director, Geological Survey, may act for the Secretary of the Interior in finally approving applications for suspension of operations or production or both, filed pursuant to 43 CFR 3102.4 and 3222.6–2 and in terminating suspensions of this kind which have been or may be granted. (The Director has redelegated to the regional oil and gas supervisors and mining supervisors the authority delegated by this paragraph. Survey Orders 210, 17 F.R. 7513, and 210, Amendment 1, 20 F.R. 6427.)

*G. Oil and gas sales contracts.* The regional oil and gas supervisors of the Geological Survey may act for the Secretary of the Interior in finally approving oil and gas sales contracts and agreements filed pursuant to 30 CFR Part 223.

H. Definition of known geologic structures of pro-

ducing oil and gas fields.

The Director, Geological Survey, is authorized to determine the boundaries of the known geologic structures of producing oil and gas fields under the Act of February 25, 1920 (41 Stat. 437), as amended (30 U.S.C., 181 et seq.).

220.4.2 *Appeals.* Any person aggrieved by any action of a regional oil and gas supervisor or a regional mining supervisor may appeal to the Director, Geological Survey, and from his decision to the Secretary of the Interior as provided in 30 CFR 221.66.

---

## Geological Survey

## REGIONAL OIL AND GAS SUPERVISORS

### Delegation of Authority Regarding Unit Agreements

The following material is a portion of the Geological Survey Manual and the numbering system is that of the Manual. Part 220 Special Redelegations, Chapter 2, Conservation Division.

1D. *Delegation of authority with respect to functions relating to unit agreements.* (220 DM 2.1 and 220 DM 4.1A)

(1) *Authority redelegated.* The Regional Oil and Gas Supervisors are authorized to perform the following functions with respect to unit agreements approved under the authority of the Secretary of the Interior under section 5 (a) (1) of the Outer Continental Shelf Lands Act of August 7, 1953 (67 Stat. 462, 464; 43 U.S.C. sec. 1334(a) (1)) and under the Mineral Leasing Act of February 25, 1920 (41 Stat. 437), as amended (30 U.S.C., 181 et seq.):

(a) Approve unit agreements submitted in identical form to that previously approved by the Director, where there is sufficient commitment to the agreement to assure effective control of operations within the unit area.

(b) Approve expansion or contraction of a unit area where such expansion or contraction has previously received the preliminary approval of the Director.

(c) Approve an amendment of an approved unit agreement where the text of the amendment is identical to that previously approved by the Director and where the owners of sufficient interests in the unitized land have executed said

(d) Concur in the operator's description of the lands automatically eliminated from a unit area under the provisions of the unit agreement.

(e) Approve the selection or designation of unit operators.

(f) Grant extensions of time for drilling test wells.

(g) Approve the establishment or revision of participating areas.

(h) Approve payment of compensatory royalty for drainage from unitized lands.

(i) Take appropriate action on commitments of interests to a unit agreement which are filed subsequent to approval of the unit agreement.

(j) Approve a request for the termination of a unit agreement where such request conforms to the procedures set forth in the unit agreement.

ARTHUR A. BAKER,
*Acting Director.*

[F.R. Doc. 68-4443; Filed, Apr. 15, 1968; 8:45 a.m.]

---

## Geological Survey

[Survey Order 218, Amdt. 1]

### REGIONAL OIL AND GAS SUPERVISORS AND REGIONAL MINING SUPERVISORS

### DELEGATION OF AUTHORITY WITH RESPECT TO SUSPENSION OF OPERATIONS AND PRODUCTION

Section 1 of Survey Order No. 218 is amended as follows:

SECTION 1. *Suspension of operations and production.* Pursuant to the authority contained in Order No. 2699 of August 11, 1952 (as amended), of the Secretary of the Interior, the regional oil and gas supervisors and the regional mining supervisors of the Geological Survey are hereby authorized to act on applications for suspension of operations or production or both, filed pursuant to 43 CFR 3102.4 and 3222.6-2 and to terminate suspensions of this kind which have been or may be granted.

Dated: November 3, 1955.

THOMAS B. NOLAN,
*Acting Director, Geological Survey.*

Approved;

CLARENCE A. DAVIS,
*Acting Secretary of the Interior.*

[F. R. Doc. 55-9061; Filed, Nov. 9, 1955; 8:47 a. m.]

## HEADQUARTERS OFFICE

Address Chief, Branch Of Oil And Gas Operations
U.S. Geological Survey
5327 General Services Administration Bldg.
18th & F Street, N.W.
Washington, D.C. 20242

## REGIONAL OFFICES

Address Regional Oil & Gas Supervisor
U.S. Geological Survey

**Alaska Region**
Post Office Box 259
Room 214 Skyline Bldg.
218 E Street
Anchorage, Alaska 99501

**Eastern Region**
5221 General Services
Administration Bldg.
Washington, D.C. 20242

**Gulf Coast Region**
Suite 326
Imperial Office Bldg.
3301 N. Causeway Boulevard
Metairie, Louisiana 70002

**Mid-Continent Region**
4002 New Federal Bldg.
333 West 4th. Street
Tulsa, Oklahoma 74103

**Northern Rocky Mountain Region**
Post Office Box 400
203 Federal Bldg.
Casper, Wyoming 82601

**Pacific Region**
7744 Federal Bldg.
300 North Los Angeles Street
Los Angeles, California
90012

**Southern Rocky Mountain Region**
Drawer 1857
Federal Bldg. & U.S. Courthouse
Richardson Ave. At 6th St.
Roswell, New Mexico 88201

## DISTRICT OFFICES

Address District Engineer
U.S. Geological Survey

Lafayette District No. 1
Post Office Box 52289
229 Cantrel Road
Lafayette, Louisiana 70501

Lafayette District No. 2
Post Office Box 52289
229 Cantrel Road
Lafayette, Louisiana 70501

New Orleans District
Suite 322
Imperial Office Bldg.
3301 N. Causeway Boulevard
Metairie, Louisiana 70002

Muskogee District
Post Office Box 750
5 Federal Bldg.
Muskogee, Oklahoma
74401

Oklahoma City District
4321 Federal Courthouse &
Office Bldg.
Oklahoma City, Oklahoma
73102

Shreveport District
201 Oil & Gas Bldg.
323 Market Street
Shreveport, Louisiana
71101

Tulsa District
3415 New Federal Bldg.
333 West 4th.
Tulsa, Oklahoma 74103

Billings District
Post Office Box 2000
316 Federal Bldg.
Billings, Montana 59103

Casper District
Post Office Box 400
410 O & G Bldg.
Casper, Wyoming 82601

Denver District
6041 Federal Bldg. &
Courthouse
Denver, Colorado 80202

Great Falls District
Post Office Box 1218
Professional Bldg.
510 First Avenue North
Great Falls, Montana
59401

Newcastle District
Post Office Box 219
214 West Main
Masonic Temple Bldg.
Newcastle, Wyoming
82701

Rock Springs District
Post Office Box 1170
201 First Security Bank Bldg.
Rock Springs, Wyoming
82901

Salt Lake City District
8415 Federal Bldg.
125 South State Street
Salt Lake City, Utah 84111

Thermopolis District
Post Office Box 690
202 Federal Bldg.
Thermopolis, Wyoming
82443

Bakersfield District No. 1
300 Federal Bldg.
800 Truxtun Avenue
Bakersfield, California
93301

Bakersfield District No. 2
300 Federal Bldg.
800 Truxtun Avenue
Bakersfield, California
93301

Santa Barbara District
209 Post Office Bldg.
836 Anacapa Street
Santa Barbara,
California 93101

Artesia District
310 Carper Bldg.
105 South 4th. Street
Artesia, New Mexico
88210

Durango District
Post Office Box 1809
128 West 10th. Street
Jarvis Bldg.
Durango, Colorado 81301

Farmington District
Post Office Box 959
409 Petroleum Plaza
3535 East 30th. Street
Farmington, New Mexico
87401

Hobbs District
Post Office Box 1157
306 North Linam Street
Hobbs, New Mexico
88240

## Geological Survey

## REGIONAL OIL AND GAS SUPERVISORS

### Delegation of Authority With Respect to Approval of Communitization or Drilling Agreements

SECTION 1. Approval of communitization or drilling agreements. The authority to give final approval to communitization or drilling agreements submitted for approval in accordance with 43 CFR 3121.3 which was delegated to the Director, Geological Survey by Departmental Order No. 2365 of October 8, 1947, is hereby redelegated to the Regional Oil and Gas Supervisors of the Geological Survey.

SEC. 2. Any person aggrieved by the action of a Regional Oil and Gas Supervisor may appeal to the Director of the Geological Survey and from his decision to the Secretary of the Interior pursuant to the provisions of 30 CFR 221.66.

THOMAS B. NOLAN,
*Director, Geological Survey.*

Approved: June 14, 1962.

STEWART L. UDALL,
*Secretary of the Interior.*

[F.R. Doc. 62-6567; Filed, July 5, 1962; 8:53 a.m.]

## JUSTICE DEPARTMENT

### Law Enforcement Assistance Administration

### NATIONAL ADVISORY COMMITTEE ON CRIMINAL JUSTICE STANDARDS AND GOALS, PRIVATE TASK FORCE

### Meeting

Notice is hereby given of a correction in the location of a meeting previously announced in the FEDERAL REGISTER.

An ad hoc working committee of the Private Security Task Force to the National Advisory Committee on Criminal Justice Standards and Goals is scheduled to meet Friday and Saturday, August 22 and 23, 1975, in Philadelphia, Pennsylvania. The meeting is still scheduled to convene at 9:00 a.m. Friday August 22, in the East Conference Room, 12th Floor, LEAA Building, at 1600 Arch Street. The location of Saturday's portion of the meeting has been changed to the Citizens' Crime Commission Office, 12 South 12th Street, also in Philadelphia.

Discussion at this meeting will focus upon the area of private security personnel training and education. The meeting will be open to the public.

For further information, please contact: Mr. William T. Archey, Director, Policy Analysis Division, Office of Planning and Management, LEAA, U.S. Department of Justice, 633 Indiana Avenue, N.W., Washington, D.C. 20531, 202/376-3762.

GERALD H. YAMADA,
*Attorney-Advisor,*
*Office of General Counsel.*

[Doc.75-21452 Filed 8-14-75;8:45 am]

## DEPARTMENT OF THE INTERIOR

### BUREAU OF LAND MANAGEMENT

### OUTER CONTINENTAL SHELF OFFSHORE SOUTHERN CALIFORNIA

### Availability of Final Environmental Impact Statement Regarding Proposed Oil and Gas Lease Sale

Pursuant to section 102(2)(C) of the National Environmental Policy Act of 1969, the Department of the Interior has prepared a final environmental impact statement relating to a proposed Outer Continental Shelf (OCS) general oil and gas lease sale of 307 tracts of submerged lands on the OCS offshore southern California.

The final environmental impact statement has been submitted to the Council on Environmental Quality and made available to government agencies and the public for review for a 30-day period from the date of availability. During this period, comments on any aspect of the final statement will be accepted and considered by the Department of the Interior. This comment period will overlap in part with the 60-day comment period for the OCS Programmatic FEIS. This is the last of three commenting periods provided by the Department of the Interior in the review of a site-specific environmental impact statement for this proposed lease sale. The first two commenting periods were announced in the FEDERAL REGISTER editions of February 21, 1975 (40 F.R. 7692) (site-specific DEIS comment period from February 21 through May 23, 1975) and April 8, 1975 (40 F.R. 15917-15918) (comments on site-specific DEIS and FEIS when issued, during 60-day OCS Programmatic FEIS comment period which commenced on July 11 and will extend through September 9, 1975).

Single copies of the final environmental statement can be obtained from the Office of the Manager, Pacific Outer Continental Shelf Office, Bureau of Land Management, 7638 Federal Building, 300 North Los Angeles Street, Los Angeles, California 90012, and from the Office of Public Affairs, Bureau of Land Management (130), Washington, D.C. 20240.

Copies of the final environmental statement will also be available for review in the main public libraries in various coastal cities in the sale area.

CURT BERKLUND,
*Director,*
*Bureau of Land Management.*

Approved:

STANLEY D. DOREMUS,
*Deputy Assistant Secretary*
*of the Interior.*

AUGUST 1, 1975.

[FR Doc.75-21003 Filed 8-14-75;8:45 am]

### Geological Survey

## DISPOSAL OF PRODUCED WATER

### Comments Requested

On May 13, 1975, the Geological Survey published in the FEDERAL REGISTER (Vol. 40, No. 93, pp. 20834-20835), a Notice which (1) suspended the performance dates prescribed in NTL-2 and NTL-2A; (2) advised of the intent to modify and combine the requirements of said Notices into a new NTL; and, (3) invited the submittal of written comments in that regard by July 15, 1975.

Written and oral comments received by the Geological Survey have been carefully considered in the preparation of a proposed new Notice. All written comments are on file with the Geological Survey. Certain of these comments have been adopted or essentially satisfied, and the Geological Survey has made other changes on its own motion. The principal changes are discussed below:

*FORMAT.* The format has been changed to incorporate all requirements for the disposal of produced water into a single Notice.

*APPROVAL AUTHORITY.* Approval of all applications and compliance enforcement has been made the responsibility of the District Engineer.

*APPLICATIONS.* The information to be submitted with the application for approval of each type disposal system has been specified.

*DISPOSAL IN UNLINED PITS.* The criteria under which the disposal of produced water in unlined pits will be permitted has been clarified.

*TIME FOR COMPLIANCE.* The compliance date has been extended to October 1, 1977.

Due to the number of changes in both format and content, the Geological Survey is soliciting written comments, suggestions, and objections concerning the requirements of the proposed Notice. Such comments are to be submitted to the Chief, Conservation Division, U.S. Geological Survey, Mail Stop 650, 12201 Sunrise Valley Drive, Reston, Virginia 22092, by September 12, 1975.

It is hereby certified that the economic and inflationary impacts of proposed Notice to Lessees and Operators, NTL-2B, have been carefully evaluated in accordance with OMB Circular A-107.

V. E. MCKELVEY,
*Director.*

---

[NTL-2B]

### DISPOSAL OF PRODUCED WATER

### NOTICE TO LESSEES AND OPERATORS OF FEDERAL AND INDIAN OIL AND GAS LEASES

This Notice supersedes NTL-2 and 2A dated _____, and March 1, 1975, respectively, and is issued pursuant to the authority prescribed in 30 CFR 221.4 and 221.32.

Lessees and operators of onshore Federal and Indian oil and gas leases or fee and State leases committed to federally-supervised unitized or communitized areas shall comply with the following requirements for the handling, storing, or disposing of water produced from oil and gas wells on such leases.

I. Disposal Requirements and Applications for Approval of Disposal Methods

By October 1, 1977, all produced water must be disposed of by (1) injection into the subsurface; (2) lined pits; or (3) by other acceptable methods. All such disposal methods must be approved in writing by the District Engineer. Any method of disposal which has not been approved as of October 1, 1977, will be considered as an incident of noncompliance and will be grounds for issuing a shut-in order until an acceptable manner of disposing of said water is provided and approved by the District Engineer.

No additional approval is required for facilities previously approved by the Geological Survey which involve the disposal of produced water into the subsurface or in lined surface pits. Likewise, no further approval is necessary for existing injection facilities utilized for pressure maintenance or secondary recovery operations.

Lessees and operators who are presently disposing of water in unlined surface pits must timely file applications with the District Engineer for approval of present or proposed disposal methods.

Supplement

Likewise, lessees and operators who are presently disposing of produced water in the subsurface or in lined surface pits ...out approval of the Geological Sur... must also file applications for ap... thereof by the District Engineer. As a minimum, such applications must specify the method of disposal and provide information concerning the quantity, quality, and source of the produced water, i.e., the daily average volume and a water analysis which includes total dissolved solids, Ph, and the concentration of chlorides and sulphates. Additional information may be required by the District Engineer.

### A. *Disposal in the Subsurface*

If approval is requested for subsurface disposal, the lessee or operator must also furnish information with respect to:

1. The injection formation and interval.
2. The quality of the fluids in the injection interval, i.e., total dissolved solids.
3. The size, weight, grade, and casing point of all casing strings, the size hole drilled to accommodate each string, the amount and type of cement used in cementing the separate strings, and the top of the cement behind each string.
4. The total and plugged back depth of the well.
5. The present or proposed method of completing the well for injection including the type and size of tubing and packer to be utilized, the setting depth of the packer, anticipated injection pressure, and information concerning ...orrosion inhibitor fluid which is to ...ed in the tubing-casing annulus. ...ans for monitoring the system to assure that injection is confined to the injection interval.

In order to be approved, subsurface disposal must be confined to formations which contain connate water of similar or poorer quality than the injected water. In general, it will be required that subsurface disposal be accomplished through tubing utilizing a packer which is designed to hold pressure from above and below. The packer should be set at a depth where the casing is protected by competent cement but usually not more than 50 feet above the injection interval. Other procedures or methods of subsurface disposal may be approved by the District Engineer when justified by the lessee or operator.

### B. *Disposal in Lined Pits*

Where approval is requested for surface disposal in a lined pit, the lessee or operator must also supply information with respect to:

1. Size and location of pit.
2. Evaporation rate for the area compensated for annual rainfall.
3. Method for periodic disposal of precipitated solids.
4. Type of material to be used for lining the pit and the method of installation.
5. Method to be employed for the detection of leaks.

...material used in lining pits must ...ervious, weather-resistant, and not subject to deterioration when contacted by hydrocarbons, aqueous acids, alkalis, fungi, or other substances likely to be contained in the produced water. Lined pits constructed after the issuance of this Notice must have an underlying gravel-filled sump and lateral system or other suitable devices for the detection of leaks. The District Engineer shall be provided an opportunity to inspect the leak detection system prior to the installation of the pit liner.

### C. *Disposal in Unlined Pits*

Surface disposal into unlined pits will not be approved unless the lessee or operator can show by application that such disposal meets any of the following criteria:

1. The water to be disposed of does not contain more than 5,000 ppm of total dissolved solids on an annual weighted average basis, provided that such water does not contain objectionable or toxic levels of any constituent.
2. The volume of water to be disposed of per facility does not exceed five barrels per day or the quantity of dissolved solids does not exceed 600 pounds on a monthly basis, whichever is greater.

For the purpose of determining the total dissolved solids in produced water, the Geological Survey will use the following formula:

Pounds/Month=Parts/Million(PPM) $\times$.00035$\times$Barrels/Month

3. That all, or a substantial part, of the produced water is being used for beneficial purposes. For example, produced water used for irrigation, livestock, or wildlife watering shall be considered as being beneficially used.
4. The specific method of disposal has been granted a surface discharged permit under the National Pollutant Discharge Elimination System (NPDES).
5. The water to be disposed of is not of poorer quality than the surface and subsurface water in the area which reasonably might be affected by such disposal.

Applications for approval of unlined surface pits must include the following additional information:

1. Size and location of the pit.
2. Evaporation rate for the area compensated for annual rainfall.
3. Percolation rate.
4. Where beneficial use is the basis for the application, written confirmation from the user(s). The water analysis submitted must also include the oil and grease content, temperature, chemical oxygen demand, and the concentration of other constituents which are toxic to animal, plant, or aquatic life.
5. If disposal is pursuant to an NPDES permit, a copy of the approved permit and the most recent "Discharge Monitoring Report."
6. Where an assertion is made that surface and subsurface fresh waters will not be affected by disposal in an unlined pit, the justification must include:

a. Analyses of all surface and subsurface waters in the area which might reasonably be affected by the proposed disposal.

b. Maps or plats showing the location of surface waters, fresh water wells, and existing water disposal facilities within two miles of the proposed disposal facility.

c. Reasonable geologic and hydrologic evidence showing that the proposed disposal method will not adversely impact on existing water quality or major uses of such waters, the depth of the shallowest fresh water aquifer in the area, and the presence of any impermeable barrier(s).

### II. *General Requirements for Permanent Surface Pits*

Lined and unlined pits approved for water disposal shall:

1. Have adequate storage capacity to safely contain all produced water given in those months when evaporation rates are at a minimum.
2. Be constructed, maintained, and operated to prevent unauthorized surface discharges of water. Unless surface discharge is authorized, no siphon, except between pits, will be permitted.
3. Be fenced, when necessary, to prevent livestock or wildlife entry to the pit.
4. Be kept free from surface accumulations of liquid hydrocarbons by use of approved skimmer pits, settling tanks, or other suitable equipment.
5. Have a continuous embankment surrounding the pit to prevent entrance of surface water.

### III. *Temporary Use of Surface Pits*

Unlined surface pits may be used for handling or storage of fluids used in drilling, redrilling, reworking, deepening, or plugging of a well provided that such facilities are promptly emptied and restored upon completion of the operations. Unless otherwise specified by the District Engineer, unlined pits may be used for well evaluation purposes for a period of 30 days.

Unlined pits may also be retained as temporary containment pits for use only in an emergency provided such pits have been approved by the District Engineer. Any emergency use of such pits shall be reported to the District Engineer as soon as possible and the pit shall be emptied and the liquids disposed of in an approved manner within 48 hours following its use, unless such time is extended by the District Engineer.

### IV. *Disposal Facilities for New Wells*

With the approval of the District Engineer, produced water from wells completed after the issuance date of this Notice may be temporarily disposed of into unlined pits for a period of 30 days. During this period, an application for approval of the permanent disposal method along with all required water analysis and other information must be submitted for the District Engineer's approval. Failure to timely file an application within the time allowed will be considered an incident of noncompliance and will be grounds for issuing a shut-in order until the application is submitted. Disposal may be continued pending the District

ngineer's determination. Once the District Engineer has determined the proper ...od of disposal, the lessee or operator ...ve until October 1, 1977, or 60 days ...ng receipt of the District Engi... determination, whichever is the longer, in which to make any changes necessary to bring the disposal method into compliance.

*V. Unavoidable Delay*

A single extension of time not to exceed three months may be granted by the District Engineer where the lessee or operator conclusively shows by application that, despite the exercise of due care and diligence, he has been unable to timely comply with the requirements of this Notice, provided that such delay will not adversely affect the environment.

*VI. Reports*

All unauthorized discharges or spills from disposal facilities must be reported to the District Engineer in accordance with the provisions of NTL-3.

An annual report for each facility which includes the total volume disposed of during the reporting period and a current water analysis which provides the same type of information required for approval of the original application.

*VII. Compliance*

Compliance with this Notice does not relieve a lessee or operator of the responsibility for complying with more stringent ...cable Federal or State water quality laws or regulations or with ... written orders of the Geological ...

---

Area Oil and Gas Supervisor.

APPROVED: RUSSELL G. WAYLAND, *Chief, Conservation Division.*

[FR Doc.75-21375 Filed 8-14-75;8:45 am]

## GEOTHERMAL RESOURCES OPERATIONAL (GRO) ORDER NO. 4

### Central and Western Regions

Notice is hereby given that pursuant to 30 CFR 270.2, the Chief, Conservation Division, U.S. Geological Survey, has approved GRO Order No. 4 for the Central and Western Regions.

The purpose of GRO Order No. 4 is to provide General Environmental Protection Requirements for geothermal resources operations in the Central and Western Regions.

The proposed Order was published in the FEDERAL REGISTER on January 28, 1975, (Vol. 40, No. 19, pages 4166–4168), with a solicitation for comments. All comments on the proposed Order were considered in preparing the final version of GRO Order No. 4. In addition, the Geological Survey, on its own motion, has revised some sections of the proposed Order to strengthen and clarify it.

Significant modifications made in the ... Order and the rationale for them ... follows:

The introduction has been amended to reflect recent changes in the Freedom of Information Act (P.L. 89-487, as amended by P.L. 93-502), with respect to treatment of proprietary data submitted under this Order and to clarify the necessary acquisition of environmental baseline data one year prior to submission of a plan for production as required by 30 CFR 270.34(k).

Paragraph 2, LAND USE AND RECLAMATION, has been amended to consider vehicular traffic in environmentally fragile areas and temporary fencing, as needed, to facilitate revegetation in reclaimed areas.

Paragraph 4, RECREATION, has been amended to provide for the relocation of recreation sites and/or access routes thereto where such relocation is approved by the Supervisor with the concurrence of the Authorized Officer.

Paragraph 5, SLOPE STABILITY AND EROSION CONTROL, has been broadened to ensure that sites for wells and surface facilities in potentially unstable areas are designed by and constructed under the supervision of a qualified engineer or engineering geologist.

Paragraph 6, BIOTA, has been extensively revised and clarified with respect to soliciting expert advice and assistance from other Government agencies or private groups to detect adverse floral and faunal trends and to provide realistic mitigating measures. A section has been added which requires reasonable replacement of species or their habitat which are significantly damaged by a lessee's operations.

Paragraph 8, SUBSIDENCE AND SEISMICITY, has been broadened to include seismicity. The introduction has been reworded for clarification of surveying and data required.

Subparagraph 8B, BENCH MARKS, has been modified to include periodic resurveying of bench marks as necessary.

Subparagraph 8D, SEISMICITY, has been retitled and modified to require monitoring and remedial actions where production or injection results in induced seismicity.

Subparagraph 9A (1), LIQUID DISPOSAL, has been modified to allow liquid waste disposal by means other than injection if all applicable water quality standards are met.

Subparagraph 9A (3) has been retitled AIR QUALITY.

Subparagraph 9A (4), PITS AND SUMPS, has been reworded for clarification, and has been modified to require fencing of unattended pits and sumps when necessary to protect wildlife, livestock, and the public.

Subparagraph 9B (2), POLLUTION REPORTS, has been changed to eliminate distinction between "minor" and "substantial" spills, and now requires a uniform reporting procedure for all pollution incidents.

Subparagraph 9C (1), PLAN OF INJECTION, has been modified to eliminate the requirement that a lessee furnish a copy of his plan of injection to adjacent lessees.

Subparagraph 9C (3), INSPECTION, has been expanded to require the immediate cessation of injection operations in the event of an injection well failure which may damage surface or fresh water aquifers.

Paragraph 10, WATER QUALITY, has been clarified regarding water analysis requirements and to provide for a suspension of a production where a health hazard exists.

Subparagraph 11C, NOISE CRITERIA, has been clarified with respect to the conditions under which a noise level of 65 dB(A) may be exceeded.

It is hereby certified that the economic and inflationary impacts of Geothermal Resources Operational Order No. 4 have been carefully evaluated in accordance with OMB Circular A-107.

V. E. MCKELVEY, *Director.*

UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY CONSERVATION DIVISION

*Geothermal Resources Operational Order No. 4*

Effective August 1, 1975

General Environmental Protection Requirements

This Order is established pursuant to the authority prescribed in 30 CFR 270.11 and in accordance with 30 CFR 270.2, 270.34(k), 270.37, 270.41, 270.42, 270.43, 270.44, and 270.76. Lessees shall comply with the provisions of this Order. All variances from the requirements specified in this Order shall be subject to approval pursuant to 30 CFR 270.42. References in this Order to approvals, determinations, or requirements are to those given or made by the Area Geothermal Supervisor (Supervisor) or his delegated representative.

All data submitted under this Order shall be available for inspection in accordance with the Freedom of Information Act of 1966 (P.L. 89-487), as amended in 1974 (P.L. 93-502), except information such as geological, geophysical, reservoir, trade secrets, and financial data and interpretations of such data, maps, and related files for which a lessee requests proprietary status, provided that such status is determined by the Supervisor to be warranted and is approved by appropriate officials of the Department of the Interior.

Protection of the environment includes the lessee's responsibility to: conduct exploration and development operations in a manner that provides maximum protection of the environment; rehabilitate disturbed lands; take all necessary precautions to protect the public health and safety; and conduct operations in accordance with the spirit and objectives of all applicable Federal environmental legislation and supporting executive orders.

Adverse environmental impacts from geothermal-related activity shall be prevented or mitigated through enforcement of applicable Federal, State, and local standards, and the application of exist-

October 21, 1974
December 31, 1974 Revision

UNITED STATES
DEPARTMENT OF THE INTERIOR
CONSERVATION DIVISION
PACIFIC AREA

# NOTICE TO LESSEES AND OPERATORS OF PUBLIC DOMAIN ACQUIRED AND INDIAN OIL AND GAS LEASES (NTL-3)

This notice is issued pursuant to the authority prescribed in 30 CFR 221.7 which provides as follows:

> "The supervisor shall prescribe the manner and form in which records of all operations, reports, and notices shall be made by lessees and operators."

Operators shall comply with the following reporting requirements:

## POLLUTION REPORTS

The following incidents, when occurring on the subject leases, shall be reported to the appropriate District Engineer as soon as practical but within a maximum of 18 hours:

1. All surface discharges of pollutants (oil, saltwater, and other liquid, or combination thereof) in excess of 10 barrels;

2. All surface discharges of pollutants, regardless of size, which have entered or threaten to enter freshwater streams, lakes, ponds, navigable waters, or that occur in environmentally sensitive areas;

3. All blowouts (loss of control of any well);

4. All accidents involving life-threatening injuries or loss of life;

5. All fires or explosions which cause damage to property, equipment, loss of oil or gas, or result in injuries to personnel; and

6. All subsurface loss of production, or other contamination or pollution.

## WRITTEN REPORTS

A written report shall be submitted in triplicate to the District Office no later than fifteen (15) days following the control or containment of any of the above incidents. Such reports shall provide information on:

1. The specific nature and cause of the incident;

2. The location where the incident occurred;

3. A description of the resultant damage and estimated volume of pollutant discharged;

4. The date and time of occurrence;

5. The length of time required to control the incident or contain the pollutants;

6. Actions that have been or will be taken to prevent recurrence of said incident;

7. Measures being taken to clean up pollutants;

8. The make or manufacturer, size, working and test pressure, date of installation, type of use, physical damage, etc. of any equipment causing or indirectly involved with the incident; and

9. Other Federal or State agencies notified of incident.

Spills of pollutants involving less than 10 barrels which have been contained and cleaned up without entering a freshwater stream, lake, or pond can be reported in writing without immediate verbal notification. Accidents not involving injury or loss of life may be reported in a similar manner. A sample reporting form is attached to this notice.

CONTINGENCY PLANS

A copy of any Spill Prevention Control and Countermeasure Plan (SPCC Plan) required by the (Federal) Environmental Protection Agency (EPA) under Part 112 of 40 CFR or other contingency plan must be submitted upon request of the appropriate District Engineer.

F. J. Schambeck — December 31, 1974
F. J. Schambeck — Date
Oil and Gas Supervisor
Pacific Area

Attached are a plat(s) and data showing District boundaries, office locations, addresses, and telephone numbers of District engineering personnel. (NOTE: Data to be compiled and attached by Area personnel.)

(Submit in triplicate)

To: District Engineer
U. S. Geological Survey
309 Federal Building
800 Truxton Avenue
Bakersfield, California 93301

From:

Subject: Pollution Report

Spill _____ Discharge _____ Blowout _____ Accident _____ Fire or Explosion _____

1. Specific Nature and Cause of Incident

2. Location of Incident

3. Description of Resultant Damage and Volume of Pollutant Discharged

4. Date and Time of Occurrence

5. Length of Time Required to Control Incident or Contain Pollutants

6. Action Taken to Prevent Recurrence

7. Measures Taken to Clean Up Pollutants

8. The make or manufacturer, size, working and test pressures, date of installation, type of use, physical damage, etc., of any equipment causing or directly involved with the incident

9. Other Federal or State Agencies Notified of Incident

Signature _____ Date _____

Title _____

## PACIFIC AREA

### Bakersfield District Office:

U. S. Geological Survey
309 Federal Building
800 Truxton Avenue
Bakersfield, California 93301

Phone: 805-861-4186

Donald F. Russell, District Engineer
Home Phone: 805-871-4620

John P. Wagner, Assistant District Engineer
Home Phone: 805-872-2240

The Bakersfield District includes the states of Arizona, California, Idaho, Nevada, Oregon and Washington.

f the ...a State Multiple Use Advi-ory L... will be held December 10 nd 11, 1975 at 8 a.m. at the Pioneer n, 221 S. Virginia Street, Reno, levada.

The Nevada State Multiple Use Advi-ory Board was established to advise and ounsel the Bureau of Land Management nd the Secretary of the Interior on ational resource land management.

This will be the first meeting of the ewly appointed board under its charter pproved by the Secretary of the In-rior on August 5, 1975. The purpose the meeting is to orient the board embers to BLM's programs, to elect fficers and to discuss necessary com-ittees. The following topics will be dis-ssed during the meeting: Role and or-anization of the board including com-ittees, current issues nationally and in evada, BLM Nevada district organi-ation study, current legislation affecting e BLM and the board's perceptions of e BLM.

The meeting is open to the public. In-rested persons may make oral pres-ntations to the board or file written tatements. Such requests should be ade to the official listed below at least days prior to the meeting.

Further information concerning this eeting may be obtained from Carl A. dlund, Chief, Public Affairs Staff, Bu-au of Land Management, Nevada State ffice, ... 3008 Federal Building, 300 ...oth ... Reno, Nevada 89502, tele-one ...4-5459.

Minutes of the meeting will be avail-le for public inspection and copying ...r weeks after the meeting at the Bu-au of Land Management, Nevada State ffice, Room 3041, Federal Building, 300 ...oth Street, Reno, Nevada 89502.

E. I. ROWLAND,
*State Director, Nevada.*

NOVEMBER 3, 1975.

[FR Doc.75-30242 Filed 11-10-75;8:45 am]

---

[OR 13853 (Wash.)]

## WASHINGTON

### Notice of Termination of Proposed Withdrawal and Reservation of Lands

OCTOBER 30, 1975.

Notice of an application Serial No. OR ...53 (Wash.), for withdrawal and res-...vation of lands was published as FED-...AL REGISTER Document No. FR 75-6093 ...page 12131 of the issue for March 17, ...5. The applicant agency has cancelled application which involved the lands ...cribed below. Therefore, pursuant to ... regulations contained in 43 CFR ...1.5-5(b), such lands will be at 10 a.m. December 5, 1975, relieved of the ...gregative effort of the above-mentioned ...plication.

The ... involved in this notice of ...le( ...re:

WILLAMETTE MERIDIAN

WENATCHEE NATIONAL FOREST

*Liberty Historical District*

T. 20 N., R. 17 E.,
Sec. 1, portions of SW¼NW¼, SE¼NW¼, and NW¼SW¼;
Sec. 2, portions of NE¼SE¼.
Further described as follows:
Beginning at Corner No. 1, the ¼ Section Corner common to secs. 1 and 2, T. 20 N., R. 17 E.
From Corner No. 1 by metes and bounds:
N. 73° 57' E., 1065.80 feet to Corner No. 2; N. 90° 00' E., 346.54 feet to Corner No. 3; S. 0° 00' E., 129.49 feet to Corner No. 4; S. 67° 30' W., 256.05 feet to Corner No. 5; S. 24° 13' W., 126.03 feet to Corner No. 6; S. 60° 35' W., 1372.50 feet to Corner No. 7; N. 38° 50' W., 291.00 feet to Corner No. 8; S. 61° 43' W., 238.09 feet to Corner No. 9; S. 63° 01' W., 307.23 feet to Corner No. 10; N. 0° 00' E., 542.10 feet to Corner No. 11; N. 73° 57' E., 708.97 feet to Corner No. 1, the place of beginning.

The area described contains approximately 23.76 acres in Kittitas County, Washington.

HAROLD A. BERENDS,
*Chief, Branch of Lands and Minerals Operations.*

[FR Doc.75-30244 Filed 11-10-75;8:45 am]

---

## Geological Survey

[NTL-6]

### FEDERAL AND INDIAN OIL AND GAS LEASES

#### Approval of Operations

Notice is hereby given that the Geological Survey proposes to formalize its procedures for approval of all applications for permits to conduct operational or construction activities on onshore Federal and Indian oil and gas leases. The proposed Notice also prescribes the information which a lessee or operator must submit in support of applications to conduct operations.

Interested parties may submit written comments, objections, and suggestions to the Chief, Conservation Division, U.S. Geological Survey, National Center, Mail Stop 650, 12201 Sunrise Valley Drive, Reston, Virginia 22092, on or before December 14, 1975.

It is hereby certified that the economic and inflationary impacts of proposed Notice to Lessees and Operators, NTL-6, have been carefully evaluated in accordance with OMB Circular A-107.

V. E. MCKELVEY,
*Director.*

NOTICE TO LESSEES AND OPERATORS OF FEDERAL AND INDIAN ONSHORE OIL AND GAS LEASES (NTL-6)

Pursuant to the National Environmental Policy Act of 1969 (83 Stat. 852), the Department of the Interior is charged with the responsibility of assuring that oil and gas operations on leased lands under its jurisdiction are conducted with due regard for the protection of the environment. Therefore, all operations which are conducted on onshore Federal and Indian oil and gas lease must conform to the requirements of this Notice as well as those contained in the lease and in the Oil and Gas Operating Regulations, Title 30 CFR Part 221.

#### I. GENERAL

In order that the environmental impact of proposed operations may be properly evaluated, all applications to conduct leasehold operations or construction activities must be accompanied by an appropriate surface use plan. As a minimum, such applications and surface use plans must provide a detailed description of the technical aspects of the proposed operation or activity, the magnitude of surface disturbance involved, and the procedures to be followed in rehabilitating the surface once the operation or construction activity has been completed. Specific requirements in this regard are set forth in Sections II(B), III, and V hereof. One copy of the surface use plan must be attached to each copy of the application to conduct operations or construction activities.

Applications to conduct operations or construction activities with attached surface use plans should be filed at least 30 days in advance of the contemplated starting date of any operation or construction activity in order to allow sufficient time in which to schedule and conduct, if necessary, a joint field inspection by appropriate personnel of the Geological Survey, the Federal surface management agency, the lessee or operator, and, if practical, the lessee's or operator's contractors and subcontractors who will perform the work. However, the early filing of an application is no guarantee that approval thereof will be granted within the 30-day period, as environmental considerations or current workload in the affected Federal agencies may result in further delay.

Lessees and operators have the responsibility to see that their exploration, development, production, and construction operations are conducted in a manner which (1) affords maximum safeguards for the environment; (2) results in the proper rehabilitation of disturbed lands; and, (3) assures the protection of the public health and safety. In that regard, lessees and operators will be held fully accountable for their contractors' and subcontractors' compliance with the applicable laws, regulations, and the requirements of the approved permit and surface use plan.

All approvals of proposed operations as well as subsequent instructions and regulation thereof will come from the District Engineer or Area Oil and Gas Supervisor of the Geological Survey. However, the Federal surface management agency will establish the rehabilitation requirements and will be available for consultation during rehabilitation

operations. Names, addresses, and phone numbers of appropriate personnel of the Geological Survey and the Federal surface management agency, as well as affected surface use areas, will be furnished the lessee or operator on its approved copy of the permit and surface use plan.

Lessees and operators, as well as their contractors and subcontractors, must not commence any operation or construction activity on a lease without the prior approval of the appropriate official of the Geological Survey. Likewise, the terms and conditions of an approved permit and surface use plan may not be altered unless the Geological Survey has approved an amended or supplemental permit and/or plan covering any such modifications. Approval of subsequent operations is addressed in Section V of this notice.

## II. Drilling Operations

### A. Preliminary Environmental Review

A preliminary environmental review will be required on all future drilling operations prior to entry on the ground for the purpose of staking the location, access roads, and other surface use areas. The lessee or operator, upon finalizing plans to drill but prior to the actual surveying, must file with the Geological Survey's District Engineer or Area Oil and Gas Supervisor and the appropriate office of the involved Federal surface management agency, a topographic map (or equivalent) of a scale not less than 1 inch = 1 mile which shows the preferred location and the general topographic features in the area. This will permit the Federal surface management agency, prior to the lessee's or operator's expenditure of time and money for surveys, to review its records for any potential conflicts with other resource values. If conflicts are noted, a joint conference or field inspection, as appropriate, by the Geological Survey, the Federal surface management agency, and the operator may be scheduled to resolve problem areas.

### B. Application for Permit to Drill

All drilling operations must be conducted in accordance with a permit or development plan which has the prior approval of the District Engineer or Area Oil and Gas Supervisor.

The permit or development plan filed for approval will consist of the application for permit to drill on Form 9-331C, and a multi-point surface use and operations plan. Where private surface is involved, it should also include a copy of the written agreement between the lessee or operator and the surface owner or a letter setting forth the rehabilitation requirements of the surface owner. The requirements for surface use and operations plans and the rehabilitation of private surface are outlined in Sections III and VI, respectively, of this notice.

The application for permit to drill must provide information concerning (1) [illegible] location in feet and direction from nearest lines of an established [illegible] determined by a registered surveyor or engineer; (2) the elevation above sea level of the ground and derrick floor or rotary kelly bushing; (3) the geologic name of the surface formation; (4) the type of tools and other equipment to be utilized; (5) the proposed drilling depth; (6) the estimated tops of important geologic markers; (7) the estimated depths at which water, oil, gas, or other mineral deposits are expected to be encountered; (8) the proposed casing program including the size, grade, weight, and safety factors for collapse, burst, and tensile of each casing; (9) the proposed setting depth of each casing string and the amount and type of cement (including additives) used to be used; (10) the proposed pressure control equipment which is to be used and a schematic diagram thereof; (11) the type and characteristics of the proposed drilling medium or mediums to be employed; (12) the testing, logging, and coring programs to be followed; (13) any abnormal pressures or temperatures expected to be encountered or potential hazards such as hydrogen sulfide gas and plans for mitigating such hazards; (14) the anticipated starting date and duration of the operation; and, (15) any other facets of the proposed operation which are pertinent to the Geological Survey's consideration of the application. The District Engineer or Area Oil and Gas Supervisor may require additional information as warranted.

A copy of approved application for permit to drill and the accompanying surface use and operations plan shall be posted at the drillsite.

### III. Multi-Point Surface Use and Operations Plan

A surface use and operations plan in sufficient detail to permit a complete appraisal of the environmental effects associated with the proposed project must be submitted, in triplicate, to the District Engineer or Area Oil and Gas Supervisor with the application for permit to drill.

The Geological Survey will send a copy of such plan to the Federal surface management agency. When possible, a preliminary field development plan or drilling schedule should also be submitted to allow lead time for evaluating environmental considerations, resource conflicts, and land use planning alternatives.

The plan shall in its context provide for and assure adequate protection of surface resources, other environmental components, and include adequate measures for reclamation of disturbed lands. The plan shall be developed in conformity with the provisions of the lease, attached stipulations, and the guidelines provided by this Notice. In developing the plan, the lessee or operator will make use of such information as is available from the Federal surface management agency concerning the surface resources, environmental considerations, and local reclamation procedures. The plan will be reviewed for adequacy by the Geological Survey and the Federal surface management agency. Approval of proposed activities that would result in irreparable or extensive damage to the environment will be withheld until the plan is modified, additional mitigating measures are provided, or alternatives to the proposed action are agreed upon.

### A. Guidelines for the Preparation of Surface Use and Operations Plans

In the preparation of surface use and operations plans, lessees and operators should adhere closely to the following:

1. *Existing roads.* A legible map (USGS topographic or county road map of a scale not less than 1 inch = 1 mile) shall be used for locating the proposed well site in relation to a town or other locatable reference point. The proposed route to the location including appropriate distances from the reference point to the point where the access route exits the highway or county road shall be shown. All proposed access roads shall be appropriately labeled or color coded. Additionally, all existing roads within a radius of three miles from the location of a proposed exploratory well should be shown. An exploratory well is a well which is located two miles or more from the boundary of a known geologic structure or a producible well. For all other drillsites (development wells) existing roads within a one-mile radius of the location should be shown.

Any plans for the improvement and/or maintenance of existing roads should also be stated.

Information required by item Nos. 3 and 4 of this subsection may also be shown on this map if appropriately labeled.

2. *Planned access roads.* Information in this regard is to be submitted on a large scale map (not less than 4 inches = 1 mile) and shall appropriately identify all permanent and temporary access roads that are to be constructed, or reconstructed in connection with the drilling and production of the proposed well. Width, maximum grade, turnouts, drainage design, location and size of culverts, and surfacing material, if any, shall be stated. At the time of submission, the location of all proposed new or reconstructed roads shall be staked. However, modification of proposed road design may be required after the location is accepted.

Information should also be furnished to indicate where existing fences will be cut and whether gates or cattleguards will be used. Additionally, the discussion should make reference to any existing gates which are to be replaced by cattleguards.

3. *Location of existing wells.* This information should be submitted on a map of suitable scale and include all wells (producing, abandoned, temporary abandoned, shut-in, injection, disposal, and drilling) within a two-mile radius of the proposed location of an exploratory well or within a one-mile radius of the proposed location of a development well.

4. *Lateral roads to well locations.* The information submitted in this regard should be shown on a map of suitable scale and include all existing and proposed lateral roads to all well locations

[illegible] one-mile radius of the proposed [illegible]

5. *[illegible]cation of tank batteries, production facilities, and production, gathering, and service lines.* Existing tank batteries, production facilities and production, gathering, or service lines within a one-mile radius of the proposed location which are owned or controlled by the lessee or operator should be shown on a map or plat of suitable scale. The type of each present facility and the exact nature of each existing line (oil flowline, gas gathering line, injection line, or water disposal line) should be identified and it should be noted which, if any, of said lines are buried. If new facilities (tank battery, other production equipment, and lines) are contemplated in the event production is established and those facilities are to be located at other than on the well site itself, the map or plat furnished in this regard must also indicate the location all proposed new facilities. Future prospects for additional development of the leasehold should be considered in the siting of new facilities. However, final approval to construct such new facilities will not be granted until after detailed plans have been submitted and evaluated pursuant to Section V hereof.

6. *Location and type of water supply (rivers, creeks, lakes, ponds, and wells).* This information may be shown by quarter-quarter section on a plat or map of [illegible]able scale or may be a written [illegible]ion. The source of all water to be used in drilling the proposed well should be noted. The method of transporting the water shall be stated and any access roads needed to haul the water will be described in items Nos. 1 or 2, as appropriate. However, the Survey's approval of the surface use and operations plan does not relieve the lessee or operator from obtaining any other authorization which may be required for the use of such water. Moreover, if a water supply well is to be drilled on the lease, it must be so stated under this item and the District Engineer or Area Oil and Gas Supervisor may require the filing of a separate application for permit to drill.

7. *Source of construction materials.* This information may be shown by quarter-quarter section on a plat or map of suitable scale or may be a written description. The proposed source, character, and use of all construction materials such as sand, gravel, stone, and soil material should be stated. Any access roads needed to haul such materials should be described in item No. 1 or 2, as appropriate.

8. *Methods for handling waste disposal.* A brief, written description should be given of the methods and location for safe containment and disposal of each type of waste material (cuttings, garbage, salts, chemicals, and sewage) which results from the drilling of the proposed [illegible]. Likewise, the narrative should include plans for the eventual disposal of [illegible]ing fluids and any produced oil or water recovered during testing operations.

9. *Ancillary facilities.* The plan or subsequent amendments to such plans shall identify all ancillary facilities such as camps and airstrips as to their location, land area required, and the methods and standards to be employed in their construction. Such facilities shall be shown on a map of suitable scale and shall be staked on the ground.

10. *Well site layout.* A plat of suitable scale (not less than 1 inch=50 feet) including cross section diagrams of the drill pad and the relation to topography are required. The plat should also include the proposed location of the mud tanks, pits (reserve, burn, and trash), pipe racks, access road, turnaround areas, parking areas, living facilities soil material stockpile, and the orientation of the rig with respect to the pad and other facilities. Plans to line the reserve pit should be indicated.

The exterior dimensions of the pad and reserve pit shall be specified and will be staked on the ground.

11. *Plans for restoration of the surface.* State the proposed program for surface restoration upon completion of the operation such as stockpiling topsoil, leveling, recontouring, and seed mixture. Such plans will be reviewed for adequacy by the appropriate Federal surface management agency. A proposed timetable for the commencement and completion of rehabilitation operations must be provided.

12. *Other information.* Include a general description of the topography, soil characteristics, formation lithologies, geologic features, flora, fauna, and other aspects of the area such as other surface use activities.

The surface ownership (Federal, Indian, State, or private) at the well location and for all lands which are to be crossed by newly constructed roads should be indicated.

Any available information which would be useful in evaluating the environmental impact of the proposed operation, including proximity to steep hillsides and gullies, water wells, ponds, lakes, or streams, occupied dwellings, or other facilities, and archeological, historical, or cultural sites should be included. Information concerning required cuts and fills during the construction of roads and the location should also be furnished.

All construction practices necessary to accommodate potential geologic hazards should be discussed under the appropriate items of the plan.

13. *Lessee's or operator's representative.* Include the name, address, and phone number of the lessee's or operator's field representative who is responsible for assuring compliance with the approved surface use and operations plan.

14. *Certification.* The following statement is to be incorporated in the plan and must be signed by the lessee's or operator's field representative who is identified in item No. 13 of the plan:

I hereby certify that I or person under my direct supervision, have inspected the proposed drillsite and access route; that I am familiar with the conditions which presently exist, that the statements made in this plan are, to the best of my knowledge, true and correct, and that the work associated with the operations proposed herein will be performed by ———— and its contractors subcontractors in conformity with this plan and the terms and conditions under which it is approved.

———————
Date

———————
Name and Title

IV. Environmental Analysis Requirements

When an application for permit to drill is received, an on-site inspection normally will be required. If made, it will include the District Engineer or Area Oil and Gas Supervisor, the lessee or operator, the Federal surface management agency, and others including the dirt contractor, as appropriate. The purpose of this inspection will be to select the most feasible and environmentally acceptable areas for well sites (considering geologic factors and Federal and State regulations), access roads and other proposed surface use areas. Accordingly, lessees and operators are encouraged to designate future development or drilling sites so that several locations may be inspected at one time.

When such an inspection is made, an environmental analysis will usually be prepared by the District Engineer or Area Oil and Gas Supervisor. Said analysis will identify methods for mitigating the potential adverse environmental effects associated with the proposed operation and will be the basis of the approving official's determination as to whether approval of the proposed activity would constitute a major Federal action significantly affecting the quality of the human environment as defined by Section 102(2)(C) of the National Environmental Policy Act of 1969. Any surface protection and rehabilitation requirements specified by the Federal surface management agency will normally be made a part of any subsequently approved permit or and/or the surface use and operations plan.

Due to the probability of a required on-site inspection, the required input from other Federal agencies, and the variations in the level of drilling activity, lessees and operators are encouraged to file applications well in advance of the time when it is desired to commence operations.

V. Approval or Subsequent Operations

Before repairing, deepening, or conditioning a well, a detailed written statement of the plan of work must be filed on Form 9-331 or 9-331C with the District Engineer or Area Oil and Gas Supervisor and approval obtained before the work is started. Any proposed change in any such plan of work must also receive the prior approval of the District Engineer or Area Oil and Gas Supervisor.

Lessees and operators are also required to submit for the approval of the District Engineer or Area Oil and Gas Supervisor

B-38

a s[illegible] plan prior to undertaking any subse[illegible]nt new construction, reconstruction, or alteration of existing facilities, including roads, dams, lines or other production facilities on any lease when additional surface disturbance will result. Sufficient information must be submitted to permit a proper evaluation of the proposed surface disturbing activities as well as any planned accommodations necessary to mitigate potential adverse environmental effects.

The environmental analysis procedures discussed in Section IV of this Notice will also apply to such subsequent operations which have the potential for significant surface disturbance although these requirements may be somewhat less in established producing areas.

### VI. Agreement for Rehabilitation of Privately-Owned Surface

Where the surface is privately owned or is owned by an Indian allottee, each application for permit to drill or to conduct other surface disturbance activities, shall contain information concerning the surface owner's rehabilitation requirements. A written agreement between the lessee or operator and the surface owner is not necessary if a letter from the lessee or the operator setting forth the surface owner's rehabilitation requirements is furnished. P[illegible]yment of damages in lieu of [illegible]restor[illegible]tion will not be an acceptable for a normal cleanup and [illegible]ation program.

If no arrangements have been made, or if information concerning such arrangements is not furnished, the District Engineer or Area Oil and Gas Supervisor will request the Federal surface management agency to recommend the necessary surface restoration requirements. In such cases, the lessee or operator will be expected to comply with these rehabilitation requirements, if any, regardless of the arrangement made with the surface owner. Provided, however, that subsequent reasonable requests by the surface owner that pits, roads, and other facilities be left intact may be honored. If written proof of prior arrangements has been provided, the Federal surface management agency will be asked to recommend surface rehabilitation requirements to the District Engineer or Area Oil and Gas Supervisor giving full consideration to the preferences of the landowner.

### VI. Well Abandonment

No well abandonment operations may be commenced in the absence of the prior approval of the District Engineer or Area Oil and Gas Supervisor. However, the Federal surface management agency may request additional surface rehabilitation measures at abandonment and these requirements are normally made a part of the Geological Survey's approval of [illegible]lonment. Upon completion of the [illegible]lonment and rehabilitation oper[illegible]s, the lessee or operator should notify the District Engineer or Area Oil and Gas Supervisor that the location is ready for inspection. However, final abandonment will not be approved until the surface rehabilitation work required by the drilling permit or abandonment notice has been completed and the required vegetation is established to the satisfaction of the appropriate Federal surface management agency.

### VII. Water Well Conversion

The complete abandonment of a well which has encountered usable fresh water will not be approved if the Federal surface management agency determines it wants to acquire the well. If, at abandonment, the Federal surface management agency elects to assume further responsibility for the well, it will reimburse the lessee or operator for the cost of any recoverable casing left in the hole solely because it is to be completed as a water well. The lessee or operator will abandon the well to the base of the deepest fresh water zone of interest as required by the District Engineer or Area Oil and Gas Supervisor and will complete the surface cleanup and rehabilitation as required by the drilling permit or abandonment notice immediately upon completion of the conversion operations.

[FR Doc.75-29641 Filed 11-10-75;8:45 am]

---

National Park Service

## BOSTON NATIONAL HISTORICAL PARK ADVISORY COMMISSION

### Notice of Meeting

Notice is hereby given in accordance with the Federal Advisory Committee Act, Public Law 92-463, that a meeting of the Boston National Historical Park Advisory Commission will be held at 10:00 a.m. on December 8, 1975, at the North Atlantic Regional Office, Room 715, 150 Causeway Street, Boston, Massachusetts.

The Commission was established by Public Law 93-431 to advise the Secretary of the Interior on matters relating to the development of the Boston National Historical Park.

The members of the Advisory Commission are as follows:

Mr. Richard A. Berenson, Chairman, Brookline, Massachusetts.
Dr. Evelyn Murphy, Lexington, Massachusetts.
Mr. Byron D. Rushing, Boston, Massachusetts.
Mrs. Katherine D. Kane, Boston, Massachusetts.
Mr. Maurice F. O'Shea, Charlestown, Massachusetts.
Mr. Guy A. Benhatl, Boston, Massachusetts.

The matters to be discussed at this meeting include:

1. The role of National Parks Service advisory commissions.
2. The organization of the Commission.
3. Status of funding.
4. Status of park administration and operations.
5. Status of cooperative agreement.
6. A review of alternative plans for the management, development and use of the resources included within the Boston National Historical Park.

The meeting will be open to the public. However, facilities and space are limited, and it is expected that not more than 25 persons will be able to attend the sessions. Any member of the public may file with the committee a written statement concerning the matters to be discussed.

Persons wishing further information concerning this meeting, or who wish to submit written statements, may contact Hugh D. Gurney, Project Manager, Boston National Historical Park at 617-223-3777. Minutes of the meeting will be available for public inspection four weeks after the meeting at the office of the North Atlantic Region, 150 Causeway Street, Boston, Massachusetts.

Dated: October 23, 1975.

Jerry D. Wagers,
*Regional Director.*

[FR Doc. 75-30370 Filed 11-10-75; 8:45 am]

---

## NORTH ATLANTIC REGION ADVISORY COMMISSION

### Notice of Meeting

Notice is hereby given in accordance with the Federal Advisory Committee Act, that a meeting of the North Atlantic Region Advisory Commission will be held at 9 a.m., e.d.t. on December 4, 1975 through 4:30 p.m. on December 5, 1975, at Minute Man National Historical Park, Lexington, Massachusetts.

The purpose of the Commission is to provide for the free exchange of ideas between the National Park Service and the public, and to facilitate the solicitation of advice or other council from members of the public on problems and programs pertinent to the North Atlantic Region.

The members of the Commission are as follows:

Mr. John N. Cole,
Brunswick, Maine.
Ms. Antoinette F. Downing,
Providence, Rhode Island.
Mrs. Arthur Fenske,
Green Village, New Jersey.
Mr. Charles H. W. Foster,
Needham, Massachusetts.
Mr. George T. Hamilton, Dover, New Hampshire.
Mr. John P. Keith, Hartsdale, New York.
Mr. Frederick R. Micha, Ontario, New York.
Mr. William A. Niering, Gales Ferry, Connecticut.
Mr. William B. Pinney, Charlotte, Vermont.

The purpose of this meeting is as follows:

1. Briefing by the North Atlantic Regional Director on current events in the Region.
2. Discuss and prepare final report of Springfield Armory visit.
3. Receive and discuss report of Acadia National Park visit.
4. The final discussion of Urban Park and Recreation.
5. Discussion of National Park Service Planning Procedure.

The meeting will be open to the public. However, facilities and space for accommodating members of the public are limited, and persons will be accommodated on a first come, first served basis. There will be a tour of Minute Man National Historical Park beginning at the Sheraton Lexington, Concord at 9 AM, December 4, 1975 and ending at 12 noon at the

# United States Department of the Interior

GEOLOGICAL SURVEY

CONSERVATION DIVISION

NOTICE

To: All Federal Lessees/Operators

As you know, each application for permit to drill under a Federal oil and gas lease must be accompanied by a 12-point development plan for surface use. The following is furnished for your information and guidance in preparing the required plan. A copy of the plan should also be furnished the appropriate Federal surface management agency at the time it is filed with the Geological Survey.

1. Existing roads including location of the exit from the main highway.

   This information should be submitted on a map (USGS topographic or county road map with a scale no less than 1 inch = 4 miles) and include at least one locatable reference point and the main access road in the vicinity of the proposed location along with all existing roads within a minimum 3-mile radius of the proposed location. Trails and shortcuts need be shown only if they will be used for access. Additional required information under Nos. 2, 3, and 4 below may be placed on this map if appropriately labeled.

2. Planned access roads.

   This information should be submitted on a map and include all access roads that are to be constructed or improved upon in connection with the drilling and producing of the proposed well. Road construction should be kept to a minimum.

3. Location of existing wells.

   This information should be submitted on a map and include all wells (producing, abandoned, temporary abandoned, shut-in, injection, drilling, etc.) within a 2-mile radius of the proposed location for an exploratory well. An exploratory well is a well 2 miles or more distant from a KGS or a producing well. For all other drill sites (development wells) such information should be shown within a half-mile radius of the proposed location.

4. Lateral roads to well locations.

This information should be submitted on a map and include all lateral roads to all well locations within a half-mile radius of the proposed location. This information may be previously covered by the data given for Nos. 1 and 2.

5. Location of tank batteries and flow lines.

This information should be submitted on a plat or map showing the proposed location of the tank battery and flow lines associated with the proposed well in the event production is established. Future development of the lease should be considered in the location of the tank battery. Existing tank batteries and flow lines within a half-mile radius of the proposed location should be shown.

6. Location and type of water supply (rivers, creeks, lakes, ponds, wells, etc.).

This information may be shown on a plat or map or may be a written description. Source of all water to be used in the drilling operations of the proposed well should be noted.

7. Methods for handling waste disposal.

A brief written description should be given of the methods for disposing of each type of waste material (cuttings, garbage, trash, etc.) from the drilling of the proposed well.

8. Location of camps.

Where applicable, this information may be shown on a map or plat, or be a written description of the location of the drill camp site. Any proposed permanent-type structures should be noted.

9. Location of airstrips.

Where applicable, any airstrip that is to be constructed or maintained for use during the drilling operations should be shown on a map.

10. Location of layout to include position of the rig; mud tanks, reserve pits, burn pits, pipe racks, etc.

This information should be shown on a plat with the approximate scale used and the compass direction shown. The general topography in the immediate area should be shown or described on the plat so the location of rig and associated facilities in relation to the surface features is apparent.

11. Plans for restoration of the surface.

State the proposed program for surface restoration upon completion of operation (stockpiling topsoil, leveling, reseeding, seed mixture, etc.). Such plans will be reviewed by the surface agency for adequacy.

12. Any other information that may be used in evaluating the impact on environment. Include general description of the topography, vegetation, and other aspects of the area.

Any available information that would be useful in evaluating the environmental aspects of the operation, including proximity to steep hillsides and gullies, cut and fill needed, etc., should be included.

The filing of the application for permit to drill and the 12-point development plan should allow adequate time for contact with any appropriate surface agency and joint inspection of the location where necessary.

# APPENDIX C

## ENVIRONMENTAL PROTECTION AGENCY

## and

## COUNCIL OF ENVIRONMENTAL QUALITY

## RULES AND REGULATIONS PERTAINING

## TO AN OIL AND GAS OPERATION

NOT INCLUDED

This appendix is solely a reproduction from the Code of Federal Regulations (CFR) text, which is a matter of public record. The appendix consists of the following CFR sections:

1. Environmental Protection Agency regulations,
   40 CFR 112, Oil Pollution Prevention

2. Council on Environmental Quality regulations
   40 CFR 1510, National Oil & Hazardous Substances Pollution contingency Plan.

   Includes 40 CFR 1510 Appendix I, II, III, IV, IX, X, XI, and XV

# APPENDIX D

## OIL AND GAS LEASE CLAUSE

## FOR PROTECTION OF THE ENVIRONMENT

*Section 2, Paragraph (q) of Federal Oil and Gas Lease, 1/ "Protection of Surface, Natural Resources, and Improvements"*

(q) *Protection of surface, natural resources, and improvements.* The lessee agrees to take such reasonable steps as may be needed to prevent operations on the leased lands from unnecessarily: (1) causing or contributing to soil erosion or damaging crops, including forage, and timber growth thereon on Federal or non-Federal lands in the vicinity; (2) polluting air and water; (3) damaging improvements owned by the United States or other parties; or (4) destroying, damaging or removing fossils, historic or prehistoric ruins, or artifacts; and upon any partial or total relinquishment or the cancellation or expiration of this lease, or at any other time thereto when required and to the extent deemed necessary by the lessor to fill any pits, ditches and other excavations, remove or cover all debris, and so far as reasonably possible, restore the surface of the leased land and access roads to their former condition, including the removal of structures as and if required. The lessor may prescribe the steps to be taken and restoration to be made with respect to the leased lands and improvements thereon whether or not owned by the United States.

1/ BLM Form 3120-7

# APPENDIX E

## FORM FOR SPECIFYING ADDITIONAL STIPULATIONS

## AFTER LEASE ISSUANCE

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

# SURFACE DISTURBANCE STIPULATIONS

Area Oil and Gas Supervisor or
District Engineer *(Address, include zip code)*

Management Agency *(name)*

Address *(include zip code)*

1. Notwithstanding any provision of this lease to the contrary, any drilling, construction, or other operation on the leased lands that will disturb the surface thereof or otherwise affect the environment, hereinafter called "surface disturbing operation," conducted by lessee shall be subject, as set forth in this stipulation, to prior approval of such operation by the Area Oil and Gas Supervisor in consultation with appropriate surface management agency and to such reasonable conditions, not inconsistent with the purposes for which this lease is issued, as the Supervisor may require to protect the surface of the leased lands and the environment.

2. Prior to entry upon the land or the disturbance of the surface thereof for drilling or other purposes, lessee shall submit for approval two (2) copies of a map and explanation of the nature of the anticipated activity and surface disturbance to the District Engineer or Area Oil and Gas Supervisor, as appropriate, and will also furnish the appropriate surface management agency named above, with a copy of such map and explanation.

An environmental analysis will be made by the Geological Survey in consultation with the appropriate surface management agency for the purpose of assuring proper protection of the surface, the natural resources, the environment, existing improvements, and for assuring timely reclamation of disturbed lands.

3. Upon completion of said environmental analysis, the District Engineer or Area Oil and Gas Supervisor, as appropriate, shall notify lessee of the conditions, if any, to which the proposed surface disturbing operations will be subject.

Said conditions may relate to any of the following:

(a) Location of drilling or other exploratory or developmental operations or the manner in which they are to be conducted;

(b) Types of vehicles that may be used and areas in which they may be used; and

(c) Manner or location in which improvements such as roads, buildings, pipelines, or other improvements are to be constructed.



Form 3109–5 (August 1973)

GPO 849-251

APPENDIX F

STATE OF OREGON DEPARTMENT OF GEOLOGY

AND MINERAL INDUSTRY RULES AND REGULATIONS

IN AN OIL AND GAS OPERATION

OREGON ADMINISTRATIVE RULES

CHAPTER 632

DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

Table of Contents


| | | | |
|---|---|---|---|
| 10-002 | General Rules | 10-156 | Spacing Units |
| 10-004 | Supremacy of Special Rules | 10-158 | Location and Spacing of Wells |
| 10-006 | Secretary to the Board | 10-160 | Pooling of Small Tracts |
| 10-008 | Definitions | 10-162 | Illegal Production |
| 10-010 | Application and Permit to Drill | 10-164 | Commingling of Production Prohibited |
| 10-012 | Changes of Location or Ownership | 10-166 | Reports by Purchasers and Producers |
| 10-014 | Drilling Practices | 10-168 | Use of Earthen Reservoirs |
| 10-016 | Identification of Wells | 10-172 | Operators to Assist in Reservoir Surveys |
| 10-018 | Organization Reports | 10-174 | Measurement of Potential Open-Flow of Gas Wells |
| 10-020 | Surface Equipment | 10-176 | Supervision of Open-Flow and Pressure Tests |
| 10-122 | Blow-Out Prevention | 10-178 | Duration of Tests |
| 10-124 | Drilling Fluid | 10-180 | Notice of Tests |
| 10-126 | Cleaning Wells | 10-182 | Gas to be Metered |
| 10-128 | Boiler or Light Plant | 10-184 | Direct Well Pressure |
| 10-130 | Rubbish or Debris | 10-186 | Gas-Oil Ratio |
| 10-132 | Tubing | 10-188 | Gas-Oil Ratio Surveys and Reports |
| 10-134 | Chokes | 10-190 | Gas Utilization |
| 10-136 | Separators | 10-192 | Disposal of Brine or Salt Water |
| 10-138 | Fire Walls | 10-194 | Water Injection and Water Flooding of Oil and Gas Properties |
| 10-140 | Slush Pits to be Filled In | 10-196 | Gas Injection of Oil and Gas Properties |
| 10-142 | Deviation | 10-198 | Abandonment, Unlawful Abandonment, Suspension, Well Plugging |
| 10-144 | Report of Result of Shooting, Perforating or Treating of Well | 10-200 | Confidential Information |
| 10-146 | Vacuum Pumps Prohibited | | |
| 10-148 | Production Practice | | |
| 10-150 | Pulling Outside Strings of Casing | | |
| 10-151 | Notification of Fire, Breaks, Leaks, or Blow-Outs | | |
| 10-152 | Producing From Different Strata Through the Same Casing String | | |
| 10-154 | Determining and Naming Pools. | | |

# OREGON ADMINISTRATIVE RULES

## GENERAL

Authority for Publication:
ORS 183.360 (1)

Contents:

Text of administrative rules or reference thereto for all agencies coming within the purview of ORS 183.310-183.510.

Replacement Pages:

Additions, amendments or repeals will be published in loose-leaf form and distributed as new or replacement pages with directions for inclusion in the compilation.

Record of Past Rules:

Replaced rules should be retained in a separate file for future reference to the prior wording of the amended or repealed rules.

## HOW TO CITE

Cite all material in this compilation by the chapter and section number. Example: Oregon Administrative Rules, Chapter 274, Section 10-110. (Short form: OAR 274-10-110)

## INDEX AND TABLE OF CONTENTS

An index and table of contents will be published with each chapter. Consideration will be given to the publication of a master index and table of contents upon completion of the compilation.

[ED. NOTE: Unless otherwise specified, sections 10-002 through 10-200 of this chapter of the Oregon Administrative Rules Compilation were adopted by the Department of Geology and Mineral Industries January 14, 1954 and filed with the Secretary of State January 27, 1954 as Administrative Order GMI 1.]

Statutory Authority: ORS 520.095

(ORS citations indicate the statutory reference concerning the matter regulated.)

10-002 GENERAL RULES. General rules shall be state-wide in application unless otherwise specifically stated and applicable to all lands within the jurisdiction of the State of Oregon.

10-004 SUPREMACY OF SPECIAL RULES. Special rules will be issued when required and shall prevail as against general rules if in conflict therewith.

10-006 SECRETARY TO THE BOARD. The director of the State Department of Geology and Mineral Industries shall act as secretary to the Board.

10-008 DEFINITIONS. As used in sections 10-010 to 10-200, unless otherwise required by context:

(1) "Allowable" shall mean the quantity of natural gas or oil allowed by order of the Board to be produced within a stated period.

(2) "Atmospheric Pressure" shall mean the pressure of air at sea level, equivalent to about 14.7 pounds to the square inch.

(3) "Barometric Pressure" shall mean the pressure or weight of air determined by the use of a barometer at a given point.

(4) "Barrel" shall mean 42 U. S. gallons equaling approximately 231 cubic inches to the gallon.

(5) "Blow-Out" shall mean a sudden or violent escape of oil or natural gas, as from a drilling well, when high formational pressure is encountered.

(6) "Blow-Out Preventer" shall mean a heavy casing-head control filled with special gates or rams which may be closed around the drill pipe, or which completely closes the top of the casing.

(7) "Bottom Hole Pressure" shall mean the pressure in pounds per square inch at or near the bottom of an oil or gas well determined at the face of the producing horizon by means of a pressure recording instrument, adopted and recognized by the oil and gas industry, and corrected to the predetermined plane.

(8) "Casing Pressure" shall mean the pressure built up between the casing and tubing when the casing and tubing are packed off at the top of the well.

(9) "Casing-Head Gas" shall mean any gas or vapor, or both gas and vapor, indigenous to an oil stratum and produced from such stratum with oil.

(10) "Combination Well" shall mean well productive of both oil and gas in commercial quantities from the same common source of supply and which has sufficient natural pressure to cause gas to enter a pipe line carrying more than atmospheric pressure.

(11) "Common Source of Supply" is Synonymous with pool.

(12) "Condensate" shall mean hydrocarbons existing in the gaseous state in the reservoir, by condensing to a liquid at pressures or temperatures below those of the reservoir. For the purpose of brevity, the use herein of the word "oil" shall include condensate as defined herein, unless otherwise provided. For instance, oil well shall mean not only an oil well but also a condensate well.

(13) "Connate Water" shall mean the water which was present with the deposition of solid sediments in an oil or gas reservoir and which has not, during the oil accumulation, been displaced.

(14) "Correlative Rights" as used in these regulations shall mean that each owner or producer in a pool is privileged to produce therefrom only in such manner or amount as not to injure the reservoir to the detriment of others or to take an undue proportion of the oil or gas obtainable therefrom, or to cause net drainage between developed units.

(15) "Cubic Foot of Gas" shall mean

the volume of gas expressed in cubic feet computed at standard pressure base of 14.65 pounds per square inch absolute and a standard temperature base of 60 degree F.

(16) "Day" shall mean a period of twenty-four consecutive hours from 7 a.m. one day to 7 a.m. the following day.

(17) "Development" shall mean any work which actively looks toward bringing in production, such as erecting rigs, building tanks, drilling wells, etc.

(18) "Developed Area or Developed Unit" shall mean a proration unit having a well completed thereon which is capable of producing oil or gas in paying quantities; however, in the event it be shown, and the Board finds, that a part of any unit is nonproductive, then the developed area of the unit shall include only that part so found to be productive.

(19) "Differential Pressure" shall mean in the case of wellhead measurement the difference between the tubing pressure and the casing pressure; in the case of an orifice meter, the pressure difference between the up-stream and the down-stream sides of the orifice, a pressure difference measured with a differential gauge or with a manometer (U tube).

(20) "Director" shall mean the director of the State Department of Geology and Mineral Industries.

(21) "Edge Water" shall mean water that holds the oil or gas, or both oil and gas, in a higher structural position usually encroaching on a pool as the oil or gas is recovered.

(22) "Field" shall mean the general area underlaid by one or more pools.

(23) "Gas" shall mean all natural gas, including casinghead gas and other hydrocarbons not defined as oil in subsection (5) of this section.

(24) "Gas Allowable" shall mean the amount of natural gas authorized to be produced by order of the Board.

(25) "Gas-Oil Ratio" shall mean the relation of the gas in cubic feet to the production of oil in barrels as accepted by pipe lines.

(26) "Gas Repressuring" shall mean the introduction of gaseous substances into a pool by artificial means in order to replenish, replace, or increase the reservoir energy.

(27) "Gas, Sour" shall mean gas which contains hydrogen-sulphide, sulphur, or other deleterious substances, in sufficient quantities to render it unfit for domestic light and fuel.

(28) "Gas Well" shall mean (a) a well which produces natural gas only; (b) that part of a well where the gas producing stratum has been successfully cased off from the oil, the gas and oil being produced through separate casing or tubing; (c) any well capable of producing gas in commercial quantities; or (d) a well producing from a reservoir containing no liquid hydrocarbons.

(29) "Illegal Gas" shall mean gas which has been produced within the State from any well or wells in excess of the amount allowed by any rule, regulation, or order of the Board, as distinguished from gas produced within the State not in excess of the amount of allowed production by any such rule, regulation, or order which is legal gas.

(30) "Illegal Oil" shall mean oil which has been produced within the State from any well or wells in excess of the amount allowed by any rule, regulation, or order of the Board, as distinguished from oil produced within the State not in excess of the amount so allowed by any such rule, regulation, or order which is legal oil.

(31) "Illegal Product" shall mean any product of oil or gas, any part of which was processed or derived, in whole or in part, from illegal oil or illegal gas or from any product thereof, as distinguished from legal product, which is a product processed or derived to no extent from illegal gas or illegal oil.

(32) "Indices of Productive Value" shall mean the factors to be considered in ascertaining the productivity of all property in a pool for the purpose of fixing the allowable production. These indices can mean, at the discretion of the Board, potential acreage, gas-oil ratios, static reservoir pressures, flowing pressures, fluid level drawdowns, the well or wells, or any other pertinent factors.

(33) "Mud-laden Fluid" shall mean

any approved mixture of water and clay or other material as the term is commonly used in the industry which will effectively seal the formation to which it is applied.

(34) "Net Drainage" shall mean the drainage or migration of oil or gas within the reservoir which is not equalized by counter-drainage.

(35) "Nomination" shall mean the statement made by a purchaser as to the amount of oil or gas he is willing to purchase for a given period.

(36) "Oil" shall mean crude petroleum oil and any other hydrocarbons, regardless of gravity, which are produced at the well head in liquid form and from gas by ordinary production methods.

(37) "Oil Allowable" shall mean the amount of oil authorized to be produced by order of the Board.

(38) "Oil Well" for the purpose of the rules, shall mean any well not a gas well capable of producing oil or condensate in paying quantities.

(39) "Operator" shall mean any person who, duly authorized, is in charge of the development of a lease or the operation of a producing well.

(40) "Overage, Overproduction" shall mean the oil or gas produced in excess of the allowable fixed by the Board.

(41) "Owner" shall mean the person who has the right to drill into and produce from a field or pool, or to appropriate the production therefrom, or both, either for himself or for himself and others."

Hist: Filed 6-20-55 as GMI 2.

(42) "Period Allowable" shall mean the period as designated in which an allowable may be produced.

(43) "Person" shall mean any natural person, partnership, corporation, association, receiver, trustee, guardian, fiduciary, executor, administrator, representative of any kind, or the State of Oregon and its political subdivisions.

(44) "Pipe Line Oil" shall mean oil free from water and basic sediment to the degree that it is acceptable for pipe line transportation and refinery use.

(45) "Pool" shall mean an underground reservoir containing or appearing to contain a common accumulation of oil and natural gas. A zone of a structure which is completely separated from any other zone in the same structure is a pool.

(46) "Potential" shall mean the computed daily ability of a well to produce oil as determined by a test made in conformity with rules prescribed by the Board.

(47) "Pressure Maintenance" shall mean (a) the reintroduction (in the early stages of field development) of gas or fluid produced from an oil or gas well to maintain the pressure of the reservoir; (b) the introduction of gas or fluid for the same purpose but obtained from an outside source.

(48) "Producer" or "owner" shall mean a person who has the right to drill into and to produce from any pool and to appropriate the oil or gas he produces therefrom either for others, for himself or for himself and others.

(49) "Product" shall mean any commodity made from oil or gas, and shall include refined crude oil, crude tops, topped crude, processed crude petroleum, residue from crude petroleum, cracking stock, uncracked fuel oil, fuel oil, treated crude oil, residuum, gas oil, casing-head gasoline, natural gas, gasoline, kerosene, benzene, wash oil, waste oil, blended gasoline, lubricating oil, blends or mixtures of oil with one or more liquid products or by-products derived from oil or gas, and blends or mixtures of two or more liquid products or by-products from oil or gas.

(50) "Proved Oil or Gas Land" shall mean the area which has been shown by development or geological information to be such that additional wells drilled thereon are reasonably certain to be commercially productive of oil or gas, or both.

(51) "Purchaser" shall mean any person who directly or indirectly purchases, transports, takes or otherwise removes production to his account from a well, wells, or pool.

(52) "Recycle" - See Pressure Maintenance.

(53) "Repressure" - See Pressure Maintenance.



F-5

(54) "Run" shall mean oil or gas piped from one place to another.

(55) "Separator" shall mean an apparatus for separating oil, gas, water, etc., with efficiency as it is produced.

(56) "Share, Fair" shall mean that part of the authorized production for the pool which is substantially in the proportion that the quantity of recoverable oil and gas in the developed area of a tract in the pool bears to the recoverable oil and gas in the total developed area of the pool, insofar as these amounts can be practically ascertained.

(57) "Shortage of Underage" shall mean the amount of production less than the allowable.

(58) "Spacing Unit" shall mean the maximum area in a pool which may be efficiently and economically drained by one well.

(59) "Storage" shall mean produced oil, gas, or both confined in tanks, reservoirs, or containers.

(60) "Storage, Underground" shall mean underground cavities either natural or artificial or both which are suitable for storage of natural gas, produced petroleum, and petroleum products. The term may also mean the produced petroleum and petroleum products confined in underground cavities.

(61) "Survey" shall mean all tests made for the purpose of obtaining information concerning the productive possibility of any geological formation and shall include electrical and directional surveys.

(62) "Waste" in addition to its ordinary meaning, shall mean "physical waste" as that term is generally understood in the petroleum industry. It includes:

(a) Underground waste and the inefficient, excessive or improper use or dissipation of reservoir energy, including gas energy and water drive, of any pool; and the locating, spacing, drilling, equipping, operating or producing of any oil well or gas well in a manner which results or tends to result in reducing the quantity of oil or gas ultimately recoverable from any pool;

(b) Surface waste and the inefficient storing of oil and the locating, spacing, drilling, equipping, operating or producing of oil wells or gas wells in a manner causing or tending to cause unnecessary or excessive surface loss or destruction of oil or gas. [1953 c. 667, section 2.]

(63) "Well" shall mean a well drilled in search of oil or gas, but shall not include core test wells, stratigraphic test wells or wells drilled for information purposes only as distinguished from wells drilled for the purpose of producing oil or gas if found. [1953 c. 667 section 1]

(64) "Well Log" shall mean the written record progressively describing the strata, water, oil or gas encountered in drilling a well with such additional information as to give volumes, pressure, rate of fill-up, water depths, caving strata, casing record, etc., as is usually recorded in normal procedure of drilling, also to include electrical survey or logging.

(65) "Wildcat Well" shall mean a drilling or producing well in an unproved area.

(66) Additional definitions may be found in ORS 520.005 and 520.015.

10-010 APPLICATION AND PERMIT TO DRILL. "Before any person shall spud in and begin the actual drilling of any well in search of oil or gas, such person shall file with the Board his application, in such form as the Board shall require for a permit to drill said well. The application shall be accompanied by the sum of $25.00, which sum is fixed as a fee for granting of a permit. When satisfied that the application and the bond are in conformance with law, the Board, shall issue a permit to the applicant, in such form as it may have established by its rules and regulations; and the number appearing upon such permit shall at all times be conspicuously displayed on the derrick used in drilling such well.

"As a further condition precedent to the granting of a permit for drilling any oil or gas well, the operator shall furnish a bond in the sum of $4,000, conditioned as provided by law and on a form supplied by the Board. The surety on the bond shall be a corporate surety

authorized to do business in the State of Oregon." (See ORS 520.025).

Hist: Filed 6-20-55 as GMI 2.

10-012 CHANGES OF LOCATION OR OWNERSHIP. (1) If, prior to the drilling of a well, the person to whom the permit was issued desires to change the location, he shall submit a letter so stating and another application properly filled out showing the new location. No additional fee is necessary, but drilling shall not be started until the transfer has been approved and the new permit posted at the new location.

(2) If, while a well is drilling or after it has been completed, the person to whom the permit was issued disposes of his interest in the well, he shall submit a written statement to the director setting forth the facts.

(3) Before the transfer of any well, the person who is to acquire it must obtain a permit and post a bond as required by section 10-010.

Hist: Filed 6-20-55 as GMI 2.

10-014 DRILLING PRACTICES. (1) Pits for Drill Cuttings: There shall be provided at every well before the actual drilling has been started, one or more pits of adequate and approved size for holding the drill cuttings removed from such well.

(2) Casing and Sealing Off Formations: Each oil, gas, brine, or fresh-water stratum above the producing horizon shall be cased and sealed off to prevent effectively the migration of oil, gas, brine, or fresh water to other areas. Such casing and sealing off shall be effected and tested in such manner and by such methods and means as may be prescribed by the director.

(3) Mud-laden Fluid to be Applied: No gas sand or stratum upon being penetrated shall be drilled or left open more than two days without the application of mud-laden fluid to prevent the escape of gas during further drilling in or through such sand stratum.

(4) Well-Head Equipment: No well shall be drilled into any formation where oil or gas under high pressure is expected to be found until the innermost string of casing shall have been equipped with an adequate high-pressure master gate valve and blow-out preventer securely anchored.

(5) Well Records (Logs): During the drilling or deepening of every well, exclusive of stratigraphic test wells and/or holes drilled solely for the purpose of seismograph operations, the owner, operator, contractor, driller, or other person responsible for the conduct of drilling operations, shall keep at the well a detailed and accurate record of the well, reduced to writing from day to day, which shall be accessible to the director upon order of the Board at all reasonable times. A copy of the records shall be furnished to the director within 20 days after the completion or abandonment of any well, but shall be kept confidential for a period of two years from the date of filing with the director.

(6) Deepening: Every person, owner, or producer who desires to deepen a well to a depth below that to which it was originally drilled shall file a written notice of intention to deepen. The notice shall set forth in detail the new proposed total depth, the plan for sealing off any oil, gas, brine, or fresh-water strata to be found or expected to be found in the deepening. If the method set forth is satisfactory and the person, owner, or producer is not in violation of the law or the rules of the Board, the director shall issue a deepening permit. The actual deepening shall not be started until the deepening permit has been posted at the well location.

10-016 IDENTIFICATION OF WELLS. Hereafter, every person drilling for oil or gas or operating, owning, or controlling or in possession of any well drilled for oil or gas, shall paint or stencil and post and keep posted in a conspicuous place near the well, the name of the person drilling, operating, owning, or controlling the well, the name of the lease, the number of the well, and the number of the permit for the well, together with the Section, Township, and Range.

10-018 ORGANIZATION REPORTS. Every person acting as principal or agent for another or independently engaged in drilling for oil or gas or in the production, storage, reclaiming, treating, or processing of crude oil or natural gas produced in Oregon shall immediately file with the Board in the form of an affidavit: the name under which such business is being conducted or operated; the name and postoffice address of such person, the business or businesses in which he is engaged; the plan of organization and, in case of a corporation, the law under which it is chartered and the name and postoffice address of any person acting as a trustee, together with the name of the manager, agent, attorney-in-fact, or principal executive thereof, and the name and postoffice address of each officer thereof. In each case where such business is conducted under an assumed name, such report shall show the names and postoffice addresses of all owners in addition to the other information required and also the name of the county in which the certificate of assumed name is filed. Immediately after any change occurs as to the facts stated in the report filed, a supplementary report under oath shall be immediately filed with the Board with respect to such change.

Hist: Filed 6-20-55 as GMI 2.

10-020 SURFACE EQUIPMENT. Meter fittings of adequate size to measure the gas efficiency for the purpose of obtaining gas-oil ratios shall be installed on the gas vent-line of every separator. Well-head equipment shall be installed and maintained in first-class condition so that static bottom hole pressure may be obtained at any time by the duly authorized agents of the Board or the director. Valves shall be installed so that pressures can be readily obtained on both casing and tubing.

10-122 BLOW-OUT PREVENTION. In drilling in areas where high pressures are likely to exist, all proper and necessary precautions shall be taken for keeping the well under control, including the use of blow-out preventers and high-pressure fittings attached to casing strings properly anchored and cemented.

10-124 DRILLING FLUID. At any time of drilling any well by rotary method, the operator shall continuously maintain in the hole, from top to bottom, good mud-laden fluid in accordance with recognized safe practice.

10-126 CLEANING WELLS. All wells shall be cleaned into a pit not less than one hundred fifty (150) feet from the derrick floor and one hundred fifty (150) feet from any fire hazard.

10-128 BOILER OR LIGHT PLANT. No boiler or electric lighting generator shall be placed nearer than 100 feet to any producing well or oil tank.

10-130 RUBBISH OR DEBRIS. Any rubbish or debris that might constitute a fire hazard shall be removed to a distance of at least 150 feet from the vicinity of wells, tanks, and pump stations. All waste shall be burned or disposed of in such manner as to avoid creating a fire hazard or polluting streams and fresh-water strata.

10-132 TUBING. All wells shall be equipped with, and produce through, tubing of not more than three inches in diameter. The bottom of tubing on flowing wells shall not be higher than 100 feet above the top of the producing sand. If the tubing is perforated, the perforations shall not extend above the top of the producing horizon. Tubing shall be free from obstructions, and have orange-peel weld or bar on the bottom in order to permit the free entrance of bottom hole instruments.

10-134 CHOKES. All flowing wells shall be equipped with chokes or beans adequate to control the flow thereof.

10-136 SEPARATORS. All flowing wells must be produced through an approved oil and gas separator.

10-138 FIRE WALLS. Every permanent

oil tank, or battery of tanks, must be surrounded by a dike or fire wall with a capacity of one and one-half times that of the tank or battery of tanks.

10-140 SLUSH PITS TO BE FILLED IN. Slush pits at producing oil wells must be filled in within a reasonable time after the completion of the well.

10-142 DEVIATION. Except by special permission of the Board the maximum point at which a well penetrates the producing formation shall not vary more than 60 feet from the vertical drawn from the center of the hole at the surface for each 1,000 feet of depth.

10-144 REPORT OF RESULT OF SHOOTING, PERFORATING OR TREATING OF WELL. Within 30 days after either the shooting or chemical treatment of a well, a report shall be filed with the director by the owner, giving the condition of the well after shooting, perforating, or treating, the size and depth of the shot or amount of chemical used, the daily production of oil, gas, and water after shooting or chemical treatment, the name of the person rendering such service, and any other pertinent information. Such report shall be signed and sworn to.

10-146 VACUUM PUMPS PROHIBITED. The use of vacuum pumps or other devises for the purpose of putting a vacuum on any gas or oil-bearing stratum is prohibited, unless, upon application and hearing, and for good cause shown, the Board shall permit the use of vacuum pumps.

10-148 PRODUCTION PRACTICE. Naturally flowing wells shall be produced at a continuous uniform rate as far as is practical, in keeping with the current allowable, unless the Board specifically permits stop-cocking to reduce the gas-oil ratio.

10-150 PULLING OUTSIDE STRINGS OF CASING. In pulling outside strings of casing from any oil or gas well, the space outside the casing left in the hole shall immediately be filled, and shall at all times be kept full of mud-laden fluid of adequate specific gravity to seal off all fresh and salt water strata and any strata bearing oil or gas which is not producing.

10-151 NOTIFICATION OF FIRE, BREAKS, LEAKS, OR BLOW-OUTS. (1) All persons controlling or operating any oil and gas wells, or receiving tanks, storage tanks, or receiving and storage receptacles into which crude oil is produced, received, or stored, shall immediately notify the Board by letter giving full details concerning all fires which occur at such oil or gas wells or tanks or receptacles on their property, and all such persons shall immediately report all tanks or receptacles struck by lightning and any other fire which destroys oil or gas, and shall immediately report any breaks in or from tanks or receptacles and pipe lines from which oil or gas is escaping or has escaped.

In all such reports of fires, breaks, leaks, or escapes, or other accidents of this nature, the location of the well, tank receptacle, or line break shall be given by Section, Township, Range, and property so that the exact location thereof can be readily located on the ground. Such report shall likewise specify what steps have been taken or are in progress to remedy the situation reported and shall detail the quantity of oil or gas lost, destroyed, or permitted to escape.

In case any tank or receptacle is permitted to run over, the escape thus occurring shall be reported as in the case of a leak. The report hereby required as to oil losses shall be necessary only in case such oil loss exceeds five barrels in the aggregate.

10-152 PRODUCING FROM DIFFERENT STRATA THROUGH THE SAME CASING STRING. No well shall be permitted to produce either oil or gas from different strata through the same string of casing without first applying for a hearing before the Board. The operator requesting such permission must present to the Board full and complete facts relative



F-9

to the operation and the reasons for requesting such permission. If a stratum should be encountered bearing either oil or gas and it is desired to drill deeper, the stratum first penetrated and likewise each and every formation in turn shall be closed and sealed off to prevent waste, either surface or underground.

10-154 DETERMINING AND NAMING POOLS. Wells shall be classified as to the pool from which they produce and pools shall be determined and named by the director, provided, that in the event any person is dissatisfied with any such classification, an application may be made to the Board for such classification as the applicant deems proper, and the Board will hear and determine the same.

10-156 SPACING UNITS. Immediately upon the discovery of any pool or at any time after the effective date of this rule, the Board may prescribe spacing units for each pool and specify the size, shape, and location thereof.

10-158 LOCATION AND SPACING OF WELLS. (1) Spacing Plan: Unless a different well-spacing plan is adopted the director will, simultaneously with the establishment of spacing units for each pool, prescribe well-spacing plans therefor, the boundaries of which shall coincide, if possible, with the boundaries of such spacing units, which plan shall require a minimum of a 40 acre spacing unless a different spacing shall be required or approved by the Board.

(2) Location of Well: Each well permitted to be drilled upon any spacing unit shall be drilled approximately in the center thereof with such exceptions as may be reasonably necessary where it is shown, after notice and upon hearing, and the Board finds, that the unit as established is partly outside the pool, where it is partly nonproductive, or, that for some other reason, a well approximately in the center of the unit would be nonproductive, or topographical conditions are such as to make the drilling in the center of the unit unduly burdensome.

(3) Exceptions: Whenever a uniform spacing plan has been prescribed for any pool exceptions thereto may be permitted if the Board finds, after notice and hearing, that conditions within such pool are such that reasonably uniform spacing would be impracticable.

10-160 POOLING OF SMALL TRACTS. When two or more separately owned tracts of land are embraced within a spacing unit which has been established by the Board, the owners thereof may pool their interests and develop their lands as a unit. Where, however, such owners have not agreed to pool their interests, the Board, for the prevention of waste or to protect correlative rights, may limit the allowable of each such owner to his reasonable prorata share of production from such spacing unit.

10-162 ILLEGAL PRODUCTION. No purchaser, producer, operator or any other person shall produce any crude oil, natural gas, or waste oil from any spacing unit or pool in this State except in accordance with the rules, regulations and orders of the Board: Provided that tank splitting shall not be required.

10-164 COMMINGLING OF PRODUCTION PROHIBITED. The production from one pool shall not be commingled with that from another pool in the same field before delivery to a purchaser, unless otherwise ordered by the Board.

10-166 REPORTS BY PURCHASERS AND PRODUCERS. (1) Purchasers: Each purchaser or taker of any oil or gas from any well, lease, or pool shall on or before the 25th day of each month succeeding the month in which the purchasing or taking occurs, file with the director on a form furnished by the Board, a verified statement of all oil or gas purchased, or taken from any such well, lease, or pool during the preceding month.

(2) Producers: The producer or operator of each and every well or spacing unit in prorated pools shall each month submit to the director a sworn statement showing the amount of production made by each well and by each such spacing

unit upon forms furnished therefor.

10-168 USE OF EARTHEN RESERVOIRS. Oil shall not be stored or retained in earthen reservoirs or in open receptacles.

10-170 RESERVOIR SURVEYS. By special order of the Board, periodic surveys may be made of the reservoirs in this State containing oil and gas. These surveys will be thorough and complete and shall be made under the supervision of the petroleum and natural gas engineers of the Board. The condition of the reservoirs containing oil and gas and the practices and methods employed by the operators shall be investigated. The volume and source of crude oil and natural gas; the reservoir pressure of the reservoir as an average; the areas of regional or differential pressure; stabilized gas-oil ratios; and the producing characteristics of the field as a whole and the individual wells within the field shall be specifically included.

10-172 OPERATORS TO ASSIST IN RESERVOIR SURVEYS. All operators of oil wells are required to permit and assist the agents of the Board and the director in making any and all tests including bottom hole pressure and gas-oil ratio determinations that may be required by the Board or director on any or all of their wells.

10-174 MEASUREMENT OF POTENTIAL OPEN-FLOW OF GAS WELLS. The potential open-flow of a gas well may be ascertained by U.S. Bureau of Mines back pressure method, or by other approved methods.

10-176 SUPERVISION OF OPEN-FLOW AND PRESSURE TESTS. All tests made in determining the potential flow and shut-in well-head or bottom hole pressure of a gas well and used in calculating the allowable of the spacing unit which the well is located shall be made under the supervision of representatives of the Board.

10-178 DURATION OF TESTS. The tests for open-flow and pressure of gas wells shall be made at such intervals and shall continue for such time as may be necessary to effect accurate determination, and in the case of pressure tests the shut-in period shall be not less than 24 hours.

10-180 NOTICE OF TESTS. Open-flow and pressure tests of gas wells may be witnessed or observed by a representative of any producer in the field, and the owners of the adjoining or offset leases must be notified by the owner of the well on which the test is to be taken, stating the time when such test will commence.

10-182 GAS TO BE METERED. (1) Meters: All gas when produced or sold shall be metered with an approved meter of sufficient capacity, provided that gas may be metered from a lease or unitized property as a whole if it is shown that ratable taking can be maintained; provided that meters shall not be required for gas produced and used on the lease for development purposes and lease operations.

(2) Meter Charts and Records: Purchasers shall keep meter charts and records on gas purchased in a permanent file, for a period of at least two years, and such information shall be made available to the Board and director.

(3) By-Passes: By-passes shall not be connected around meters in such manner as to permit the improper taking of gas.

10-184 DIRECT WELL PRESSURE. The use of direct well pressure to operate any machinery is hereby prohibited.

10-186 GAS-OIL RATIO. No well shall be permitted to produce gas in excess of the maximum ratio determined for a pool unless all gas produced in excess thereof is returned to the pool from which it was produced.

10-188 GAS-OIL RATIO SURVEYS AND REPORTS. Gas-oil ratios and surveys shall be taken in the manner prescribed by the Board for individual fields where upon gas-oil ratio limits have been fixed and in accordance with the rules prescribed for each individual pool.

(1) Flowing Wells Intermittently (Stop-



F-11

cocked) Produced: In computing the operating gas-oil ratio the total volume of gas and the total barrels of oil that are produced in order to obtain the daily oil allowable must be used regardless of the flowing time in the 24-hour period.

(2) Gas Lift or Jet Wells: The total volume of gas to be used in computing the operating gas-oil ratio is the total output volume minus the total input volume.

(3) Pumping Wells: Should gas be withdrawn from the casing in an attempt to maintain a fluid seal, or for any other reason, this volume of gas must be added to the gas produced through tubing in computing the gas-oil ratio.

10-190 GAS UTILIZATION. After the expiration of two days from the time of encountering gas in a gas well, no gas from such well shall be permitted to escape into the air, and no gas produced therefrom shall be utilized except for domestic or commercial purposes.

10-192 DISPOSAL OF BRINE OR SALT WATER. In addition to the requirement of the Act to prevent the escape of oil or gas out of one stratum to another and to prevent the pollution of fresh water supplies by oil, gas, or salt water, and in addition to any regulations of the State Sanitary Authority, the following conditions shall control the disposal of brine or salt water liquids, and any other means or methods of disposal, except re-injection into the formation, are hereby prohibited: (1) Disposal in Earthen Pits: Brine or salt water may be disposed of by evaporation when impounded in excavated earthen pits, which may be used for such purpose only when the pit is underlaid by tight soil such as heavy clay or hardpan.

Impounding of brine or salt water in earthen pits that are porous and closely underlaid by a gravel or sand stratum hereby is prohibited. Earthen pits used for impounding brine or salt water shall be so constructed and maintained as to prevent the escape of fluid.

The Board shall have authority to condemn any pit which does not properly impound such water and order the disposal of such water into an underground formation, as herein provided.

The level of brine or salt water in earthen pits shall at no time be permitted to rise above the lowest point of the ground surface level. All pits shall have a continuous embankment surrounding them sufficiently above the level of the surface to prevent surface water from running into the pit. Such embankment shall not be used to impound brine or salt water.

At no time shall brine or salt water impounded in earthen pits be allowed to escape over adjacent or into streams.

(2) Disposal by Injection: Salt water may also be disposed of by injection into the strata from which produced or other proved salt water bearing strata.

10-194 WATER INJECTION AND WATER FLOODING OF OIL AND GAS PROPERTIES. (1) Application and Approval: The owner or operator of any well may inject water under pressure into the formation containing oil or gas for the purpose of obtaining oil or gas from the reservoir, upon application to and approval by the Board.

(2) Casing and Cement: Wells used for the injection of water into the producing formation or repressuring wells shall be cased with sound casing so as not to permit leakage and the casing cemented in such manner that damage will not be caused to oil, gas, or fresh water resources.

(3) Application, Contents, Notice, Objection, Hearing, and Approval: (a) No water injection or water flooding program shall be instituted until it has been regularly authorized by the Board.

(b) The application therefor shall be verified and filed with the Board, showing:

(A) The location of the intake well.

(B) The location of all oil and gas wells, including abandoned and drilling wells and dry holes, and the name of landowners and lessees within one-half mile of the intake well.

(C) The formations from which wells are producing or have produced.

(D) The name, description, and depth of the formations to be flooded

(E) The depths of each formation into

which water is to be injected.

(F) The elevations of the top of the oil or gas bearing formation in the intake well and the wells producing from the same formation within one-half mile radius of the intake well.

(G) Log of the intake well or similar information as is available.

(H) Description of the intake well casing.

(I) Description of the liquid, stating the kind, where obtained, and the estimated amounts to be injected daily.

(J) The names and addresses of the operators.

(K) Such other information as the Board may require to ascertain whether the flooding may be safely and legally made.

(c) Applications may be made to include the use of more than one intake well on the same lease, or on more than one lease.

(d) Applications shall be executed by all operators who are to participate in the proposed water injection or water flooding plan.

(e) No order approving water injection or water flooding of oil properties shall be issued until after notice has been given by the Board to each operator in such pool, and hearing has been had before the Board.

(4) Notice of Commencement and Discontinuance of Water Injection or Water Flooding Operations:

(a) Immediately upon the commencement of water injection or water flooding operations, the applicant shall notify the Board stating the date of commencement.

(b) Within 10 days after the discontinuance of water injection or water flooding operations the applicant or the one in charge thereof shall notify the Board of the date of such discontinuance and the reasons therefor.

(c) Before any intake well shall be abandoned, notice shall be served on the Board, and the same procedure shall be followed in the plugging of such well as provided for the plugging of oil and gas wells.

(5) Records: The owner or operator of an intake well shall keep an accurate record of (a) the amount of water injected into the intake wells, (b) the total amount of water produced, and (c) the total amount of oil produced from the area flooded. Such information shall be made available to the Board or its agents.

10-196 GAS INJECTION OF OIL AND GAS PROPERTIES. (1) Application and Approval: The owner or operator of any well may inject gas under pressure into the formation containing oil or gas for the purpose of obtaining oil or gas from the reservoir, upon application to and approval by the Board.

(2) Casing and Cement: Wells used for the injection of gas into the producing formation shall be cased with sound casing so as not to permit leakage and the casing cemented in a manner that damage will not be caused to oil, gas, or fresh water resources.

(3) Application, Contents, Notice, Objection, Hearing and Approval: (a) No gas shall be injected into a well for gas injection purposes until so ordered by the Board pursuant to application and notice as herein required.

(b) The application shall be verified and filed with the Board showing:

(A) The location of the intake well.

(B) The location of all oil and gas wells, including abandoned and drilling wells and dry holes, and the name of landowners and lessees within one-half mile of the intake well.

(C) The formations from which wells are producing or have produced.

(D) The name, description, and depth of the formations to be injected.

(E) The depths of each formation into which gas is to be injected.

(F) The elevations of the top of the oil or gas bearing formation in the intake well and the wells producing from the same formation within one-half mile of the intake well.

(G) The log of the intake well, or similar information as is available.

(H) Description of the intake well casing.

(I) Description of the gas, stating the kind, where obtained, and the estimated amounts to be injected daily.

(J) The names and addresses of the operators.

(K) Such other information as the Board

may require to ascertain whether the gas injection plan meets the requirements of the law and safety.

(c) Applications may be made to include the use of more than one intake well on the same lease or on more than one lease.

(d) Applications shall be executed by all operators who are to participate in the proposed gas injection plan.

(4) Notice of Commencement and Discontinuance of Gas Injection: (a) Immediately upon commencement of gas injection operations, the applicant shall notify the Board stating the date of commencement.

(b) Within 10 days after the discontinuance of gas injection operations, the applicant or the one in charge of the operations shall notify the Board of the date of discontinuance and the reasons therefor.

(c) Before any intake well shall be abandoned, notice shall be served on the Board and the same procedure shall be followed in the plugging of such well as provided for the plugging of oil and gas wells.

(5) Records: The owner or operator of the gas injection project shall keep an accurate record of (a) the amount of gas injected into the intake wells, (b) the amount of gas produced and (c) the amount of oil produced from leases affected by the gas injection. Such information shall be made available to the Board or its agents.

10-198 ABANDONMENT, UNLAWFUL ABANDONMENT, SUSPENSION, WELL PLUGGING. (1) Oil, Gas, and Water to be Protected: Before any well or any producing horizon encountered therein shall be abandoned, the owner or operator shall use such means, methods, and procedure as may be necessary to prevent water from entering any oil or gas-bearing formation, and to protect any underground or surface water that is suitable for domestic or irrigation purposes from waste, downward drainage, harmful infiltration and addition of deleterious substances.

The operator of any hole drilled for oil and gas which penetrates a usable fresh-water horizon, except those drilled for the purposes of seismic prospecting, shall be required to set casing through this formation and cement such casing from top to bottom, unless special exception is granted by the Board.

(2) Suspension: Removal of Equipment: Application: Extension: The Board may authorize a permittee to suspend operations or remove equipment from a well for the period stated in the Board's written authorization, given upon written application of the permittee and his or its affidavit showing good cause. The period of suspension may be extended by the Board, upon written application made before expiration of the previously authorized suspension, accompanied by affidavit of the permittee showing good cause for the granting of such extension.

(3) Abandonment: Notice of Intention: Presumptions: (a) Before any work is commenced to abandon any well drilled for oil or gas, the permittee shall give written notice to the Board of his intention to abandon such well. The notice shall be upon forms supplied by the Board and shall contain the permit number of the well and such other information as reasonably may be required by the Board.

(b) After operations on or at a well have been suspended with the approval of the Board pursuant to subsection (2) of this rule, if operations are not resumed within six months from the date specified in such approval of suspension, an intention to abandon and unlawful abandonment shall be presumed unless the permittee has obtained from the Board an extension of time of such suspension, upon his or its written application and affidavit showing good cause for the granting of such extension.

(c) Whenever operations on or at any well shall have been suspended for a period of six months without compliance with these regulations, the well shall be presumed unlawfully abandoned.

(d) A well shall be deemed unlawfully abandoned if, without notice given to the Board as required by these rules, any drilling or producing equipment is removed.

(e) Any unlawful abandonment under these regulations shall be declared by the Board and such declaration of abandonment shall be entered in the Board



F-14

minutes and written notice thereof mailed by registered mail both to such permittee at his last known post office address as disclosed by the records of the Board and to the permittee's surety; and the Board may thereafter proceed against the permittee and his or its surety.

(f) All wells abandoned or declared abandoned as herein provided shall be plugged as required by law and by these regulations.

(g) The bond furnished by permittee shall not be released until all procedures required by these regulations shall have been completed and the Board in writing shall have authorized such release.

(4) Plugging Methods and Procedure: The methods and procedure for plugging a well shall be as follows: (a) The bottom of the hole shall be filled to the top of each producing formation, or a bridge shall be placed at the top of each producing formation, and in either event a cement plug not less than 15 feet in length shall be placed immediately above each producing formation whenever possible.

(b) A cement plug not less than 15 feet in length shall be placed approximately 50 feet below all freshwater bearing strata.

(c) A plug shall be placed at the surface of the ground in each hole plugged in such manner as not to interfere with soil cultivation.

(d) The interval between plugs shall be filled with an approved heavy mud-laden fluid.

(e) The operator shall have the option as to the method of placing cement in the hole by (A) dump bailer, (B) pumping through tubing, (C) pump and plug, or (D) other method approved by the Board.

(5) Affidavit on Completion: Copies: Within 20 days after the plugging of any well has been accomplished, the owner or operator thereof shall file an affidavit with the director setting forth in detail the method used in plugging the well. Such affidavit shall be made on a form supplied by the Board. Copies of well-plugging records and affidavits filed, except those relating to core drilling and seismic or other wells drilled for geological data, will be furnished to anyone requesting them on payment of 50 cents per copy.

(6) Seismic Core and Other Exploratory Holes to be Plugged: Methods: Affidavit: Before abandoning any hole drilled for seismic, core, or other exploratory purposes, which hole penetrates a usable fresh-water horizon, it shall be the duty of the owner or driller of such hole to plug the same in such manner as to protect properly all water-bearing formations; and within 60 days after the plugging, an affidavit shall be filed with the Director by the owner or driller, setting forth the location of the holes and the method used in plugging the same to protect water-bearing formations.

(7) Wells Used for Fresh Water: (a) When the drilled well to be plugged may safely be used as a fresh-water well and such use is desired by the land owner, the well need not be filled above the required sealing plug set below fresh water; provided, however, authorization for use of any such well shall be obtained from the State Engineer, in conformance with chapter 708, Oregon Laws 1955.

(b) Application for leaving the well partially unplugged as a fresh-water well may be made to the Board by the land owner, accompanied by his affidavit as to his need of water and the intended use of the well, together with certified copy of the State Engineer's order or permit, or that officer's statement that no permit is required.

(c) The operator shall leave the fresh-water well in a condition approved by the Board.

Hist: Filed 4-3-56 as GMI 3.

10-200 CONFIDENTIAL INFORMATION. No information herein required to be furnished to the Board shall be disclosed by any employee of the Board except as expressly authorized by the Board.



F-15

# APPENDIX G

## STATE OF OREGON"S DEPARTMENT OF ENVIRONMENTAL QUALITY ADMINISTRATIVE RULES AND REGULATIONS IN AN OIL AND GAS OPERATION

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE MEMO

To: Mr. R. E. Corcoran, State Geologist
Department of Geology and Mineral Industries

Date: September 2, 1975

From: Mr. Loren Kramer, Director
Department of Environmental Quality

Subject: SPECIAL CONDITIONS TO APPLY TO ALL DEEP WELL EXPLORATORY DRILLING IN OREGON

1. If a geothermal, mineral or petroleum resource of commercial interest is discovered, no drilling of additional wells or operations in connection therewith shall commence until an Environmental Impact Statement has been prepared for utilizing and developing the resource.

2. Prior to commencement of any drilling activities where drilling depth is expected to be in excess of 1,000 feet, detailed plans and specifications shall be submitted to and approved by the Department of Environmental Quality for collection and disposal of drill cuttings and mud, and other potential waste materials.

3. A contingency plan shall be submitted to the Department of Geology and Mineral Industries prior to any deep well drilling activities outlining the following information procedures.

   a. Measures taken to prevent emergency conditions or unplanned discharges, such as blowouts.

   b. A description of preventive facilities to contain or treat unplanned discharges.

   c. The reporting system to be used to alert facility management and appropriate legal authorities.

   d. A list of personnel and equipment available to respond to emergency conditions.

4. Upon determination of the Director of the Department of Environmental Quality or the Director of the Department of Geology and Mineral Industries that any activities conducted by the permittee in relation to its drilling operations or activities may tend to or will cause damage, hazards, pollution or risk to the environment of Oregon or may violate any conditions of permits issued by the aforementioned departments, the permittee shall when notified either orally or in writing by the Director of either department immediately cease and desist its drilling operations or activities until the problem has been corrected.

5. All drilling processes and all waste mud and waste waters collection, treatment and disposal facilities shall be operated and maintained at all times in a manner which will prevent a direct discharge or indirect discharge of any waste mud and waste waters to the waters of the state.

DEQ 1

6. All waste mud and waste waters are to be discharged into self-contained, non-overflow holding ponds.

7. All access roads, trails, drainage systems and the drilling site shall be constructed and maintained to minimize soil disturbances, control erosion and prevent channeling.

8. All refuse shall be disposed of at a refuse site which has a valid permit from the Department of Environmental Quality.

9. No geothermal waters, mineralized waters, oily waters or other waters or substances which might cause the Water Quality Standards of the State of Oregon to be violated shall be discharged or otherwise allowed to reach any of the waters of the state unless a permit for the discharge has been issued by the Department of Environmental Quality.

10. Sanitary wastes shall be disposed of in chemical or gas fired toilet facilities which have been installed in accordance with the recommendations of the Department and the local county health department or by other approved means.

11. In the event a breakdown of equipment or facilities causes a violation of any of the conditions of this permit or results in any unauthorized discharge, the permittee shall:

    a. Immediately take action to stop, contain and clean up the unauthorized discharges and correct the problem.

    b. Immediately notify the Department of Environmental Quality and the Department of Geology and Mineral Industries so that an investigation can be made to evaluate the impact and the corrective actions taken and determine additional action that must be taken.

    c. Submit a detailed written report describing the breakdown, the actual quantity and quality of resulting waste discharges, corrective action taken, steps taken to prevent a recurrence and any other pertinent information.

    Compliance with these requirements does not relieve the permittee from responsibility to maintain continuous compliance with the conditions of this permit or the resulting liability for failure to comply.

12. Authorized representatives of the Department of Environmental Quality or the Department of Geology and Mineral Industries shall be permitted access to the premises of all facilities owned and operated by the permittee at all reasonable times for the purpose of making inspections, surveys, collecting samples, obtaining data and carrying out other necessary functions related to this permit.

# APPENDIX H

## PUBLIC INTEREST

## SOLICITED AND RECEIVED



Employee
DM
Adm.
Receive

Oregon High Desert

Study Group

720 S.E. Park
Corvallis, Or. 97330
April 3, 1976

**COLLEEN GOODING**
COORDINATOR

POST OFFICE BOX 25 ▪ ST. PAUL, OREGON 97137

Chris Vosler, District Manager
74 S. Alvord
BLM Burns Dist. Office
Burns, Or. 97720

Dear Mr. Vosler:

I am writing about the proposed oil and gas lease area which includes Riddle Mountain. Since granting of leases can result in development, the alternative values of the area should be considered in the EAR. The OHDSG is especially concerned about the western part of the lease area which includes the Desert Trail and Riddle Mountain. Riddle Mt. probably has scenic value, and according to Russ Pengelly, has recreation values for chukar hunting and as a point of interest on the Desert Trail. The OHDSG recommends that scenic withdrawl would be appropriate for the Riddle Mt. area, aproximately the area west of sections 35, 26, 27 and 14, T28S, R34E. We would like to make a final recommendation after visiting Riddle Mt, which we could do on our April trip to Diamond Craters.

Other alternative values of the lease area to address in the EAR are: grazing and if recommendations in the Drewsey grazing EIS are affected, critical wildlife habitats, unique and endangered plants, and possible archeological sites.

Sincerely,
Julie Ambler
Julie Ambler, OHDSG Rep. for Burns Dist.
Burns Multiple Use Advisory Board

cc: Bill Phillips, Drewsey BLM Area Manager
Russ Pengelly, Desert Trail Association
Carl Mayo, Chairman of Burns Multiple Use Advisory Board

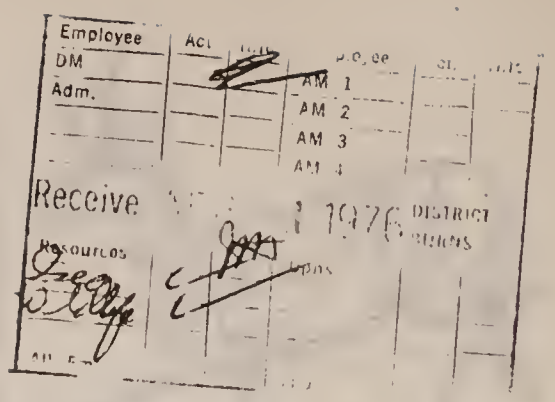
# DEPARTMENT OF FISH AND WILDLIFE

## OFFICE OF THE DIRECTOR

1634 S.W. ALDER STREET • • PORTLAND, OREGON • • 9720

P.O. Box 8
Hines, Oregon 97738

Ph. 573-6582



ROBERT W. STRAUB
GOVERNOR

COMMISSIONERS
ALLAN L. KELLY
Chairman
FRANK POZZI
Vice Chairman
MRS. ALLEN BATEMAN
Member
JOHN BOYER
Member
WALTER H. LOFGREN
Member
McKEE A. SMITH
Member
JACK STEIWER
Member
JOHN W. McKEAN
Director


March 29, 1976

Mr. Chris Vosler
District Manager, Burns District
Bureau of Land Management
74 S. Alvord Street
Burns, Oregon 97720

Dear Chris:

The following comments are offered relative to effects of oil and gas leasing and possible development on the Riddle Mountain-Burnt Flat area.

We do not feel that exploratory drilling on a limited scale (up to six to 10 widely scattered wells) would have a detrimental effect on wildlife and its habitat, unless the work involved disturbance of a substantial ground area and included new access development and/or improvement of current access. If additional access is deemed necessary, we recommend the closure of such roads upon work completion. This would best be accomplished by ripping the road and seeding with appropriate grass, forb and/or shrub and tree species. Any water developed in conjunction with the exploratory work should be planned so as to benefit livestock and wildlife. It would be most desirable if the work would commence after July 1 of any year so as to avoid conflict with deer and antelope fawning and much of the bird nesting. No work should be located within one-half to three-quarters of a mile of any watering site used by antelope and no camps should be located near any known and valuable wildlife water source. Additionally, we would like to have the opportunity to review and discuss work site locations with your office prior to final site selection, if possible.

We believe this would be the best way to avoid problems for the resident wildlife.

This lease area contains much valuable wildlife habitat. Mule deer are scattered throughout much of the area at all seasons of the year. Antelope, sagegrouse, chukars and some valley quail are also found in suitable habitat within this unit. Most of the juniper-sagebrush ridges provide good deer habitat. Some of the better deer habitat is provided on Riddle and Anderson Mountains, the breaks and rims above Anderson Valley and the expanse of country from near Summit Spring, through Lambing Canyon and on to Five Cent Lake and Burnt Flat.

Antelope make good use of the silver sagebrush and low sagebrush flats within the lease area. Good antelope habitat is provided around Burnt Flat and the area south of Anderson Valley. Antelope, however, may be found throughout the lease area.

Sagegrouse are scattered throughout much of this area. Development work should avoid concentration areas such as strutting grounds and wintering areas. This can probably best be coordinated by mutual discussion and inspection prior to final work site selection. Chukars are found on the rougher more rocky terrain such as that exemplified by the generally southeast facing steep slopes of Steens Mountain from Lambing Canyon to above Five Cent Lake. Valley quail may be found associated with the chukars and around human habitation.

A listing of wildlife species that could normally be expected to be found on this lease area follows:

Lizards

Long-nosed leopard lizard
Great Basin fence lizard
Northern sagebrush lizard
Northern side-blotched lizard
Pygmy horned lizard
Northern desert horned lizard
Western skink
Great Basin whiptail lizard

Snakes

Striped whipsnake
Western yellow-bellied racer
Gopher snake
Valley garter snake
Wandering garter snake
Desert night snake
Western rattlesnake

## Birds

Great blue heron
Mallard
Pintail
Cinnamon teal
Sagegrouse
Valley quail
Chukar
Turkey vulture
Red-tailed hawk
Prairie falcon
Pigeon hawk (American kestrel)
Killdeer
Western sandpiper
Common snipe
California gull
Ring-billed gull
Mourning dove
Barn owl
Great horned owl
pygmy owl
Burrowing owl
Common nighthawk
Black-chinned hummingbird
Belted kingfisher
Red-shafted flicker
Western kingbird
Say's phoebe
Gray flycatcher
Horned lark
Violet-green swallow
Cliff swallow
Black-billed magpie
Common raven
Canon wren
Rock wren
Sage thrasher
Robin
Mountain bluebird
Townsend's solitaire
Northern shrike
Loggerhead shrike
Starling
House sparrow
Western meadowlark
Red-winged blackbird
Brewer's blackbird
Brown-headed cowbird
Lark sparrow
Black-throated sparrow
Sage sparrow
Song sparrow

## Frogs and Toads

Great Basin spadefoot toad
Western toad
Spotted frog
Pacific tree frog

## Mammals

Antelope
Mule deer
Jack rabbit (black-tailed)
Cottontail
Pygmy rabbit
Klamath chipmunk
Sagebrush chipmunk
Golden-mantled ground squirrel
Antelope ground squirrel
Sage squirrel
Yellow-bellied marmot
Bushy-tailed wood rat
Grasshopper mouse
White-footed deer mouse
Canyon mouse(?)
Desert harvest mouse
Meadow mouse
Pygmy mouse
Jumping mouse
Kangaroo rat
Pocket mouse
Bobcat
Coyote
Badger
Spotted skunk
Little brown bat
Little canyon bat
(Possibly some others)

Development of this area could be a wilflife disaster due to factors such as increased access, actual habitat destruction, wildlife harassment and displacement and increased poaching. Development would also add the area to the growing list of good hunting areas lost to increased human activities. If the work in this area goes beyond the exploratory level, we would like to further discuss potential impacts with your office.

Please contact us if you have any questions concerning wildlife and their habitat on this area, and thank you for the opportunity to comment on this proposal.

Very truly yours,

Allan Polenz, Wildlife Biologist
Southeast Region

ARP:pb

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
Portland Field Office
919 N.E. 19th Avenue
Portland, Oregon 97232

Reference: ES

April 1, 1976

MEMORANDUM

To : District Manager, Bureau of Land Management, Burns, Oregon

From : Field Supervisor, Fish and Wildlife Service, Portland, Oregon

Subject: Effects of Oil and Gas Leasing in the Burns Area (Reference 3100)

Your Invitation to Participate requested our comments concerning the effect of oil and gas leasing and possible development on a large area southeast of Burns.

The general area shown on the map accompanying the request is large and does not clearly identify actual leases. Many species of fish and wildlife are present in the indicated area, and oil and gas exploration and development may cause serious losses depending on the location and extent of development.

Oil and gas development in the area would cause some disturbance of fish and wildlife habitat. How much disturbance would depend on what care is taken to avoid detrimental exploration and construction practices. Improper road construction, for example, can result in denuded hillsides and streambanks. Such practices often lead to erosion problems which, in turn, can result in deteriorating water quality and loss of fish and wildlife habitat.

Our primary concern is to preserve the lease-site environment. To accomplish this goal, we recommend strict adherence to the water quality regulations of the Department of Environmental Quality regarding land development. Should they apply, the proposed regulations recommended

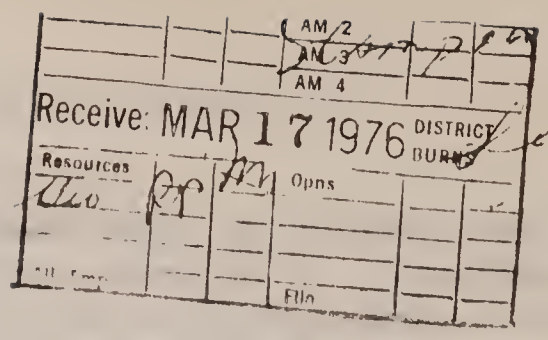
by the Division of State Lands regarding leasing activities should be considered. In addition, we would appreciate being contacted prior to actual selection of a specific lease site(s) so that we may provide more detailed input early in the planning process. We would also be interested in attending any future public meetings which may be scheduled to discuss the above lease sites.

We appreciate having the opportunity to comment on this proposal.

for R O'Leary

John W. Kincheloe

15 March, 1976




3-17-76

L. Christain Vosler, District Manager
Bureau of Land Management
75 S. Alvord
Burns, Oregon 97720

Dear Chris:

These comments concern the proposed oil and gas lease behind Follyfarm, on the north end of Steens Mountain. The comments herein are our own, and do not necessarily reflect the opinions of any of our associates or employers.

One of our forebearers, J.H. Neal, with his family, who were among the earliest pioneers in Southeast Oregon, settled in Sunrise Valley, and began the community of Follyfarm, in 1905. From there, and building from the family experiences and ties in Harney County since then, both the family and its associated ranching enterprises grew. Although the Follyfarm is no longer owned by any member of the family, we are deeply concerned about it, the area around it, Steens Mountain, and the Southeast Oregon desert. Many of the physical features in the area were named for various family members: Neal Hill, Neal Lake, Mary's Lake, and so on. This area is a part of our heritage, and we would not leke to see our cultural area defaced in any way. Several of the family homesteads were also in the area of the proposed oil and gas lease.

The view from, and of the east side of the Steens is unmatched by any, anywhere. We would not like to see access roads and their ugly scars crawling all over her. The roads necessary to get equipment into the area will be disruptive to wildlife in the area, and any road improvements would naturally attract more road users: hunters, tourists, rockhounds, scroungers, etc., and their associated damages - both to landscape and landlife.

If the permit must be issued, we definitely do not want access granted to the area from any point on the east side of the Mountain: Quail Creek, Lambing Canyon, Juniper Grade, and so forth. Further, the roads from the north and west into the area are barely that - and should remein so - with no more traffic than they currently receive, perhaps even less.

We want that portion of Steens Mountain, and including all of the Mountain eventually, to be preserved for its great scenic beauty, and as a resource for wildlife and livestock - without making it a Wilderness - honoring the natural beauty and the interrelationships with the livestock industry and its pioneers in the area. The "energy problem" can be solved in other ways, with exclusion from this area not breaking or making the difference. It seems that these corporations are just sinking hole after hole, knowing that they will not find anything, but only for tax advantages, and are screwing up our area in the process.

Respectfully

William R. Renwick II  Jean C. Fleming-Renwick  William R. Renwick

Ida M. Renwick  George W. Renwick

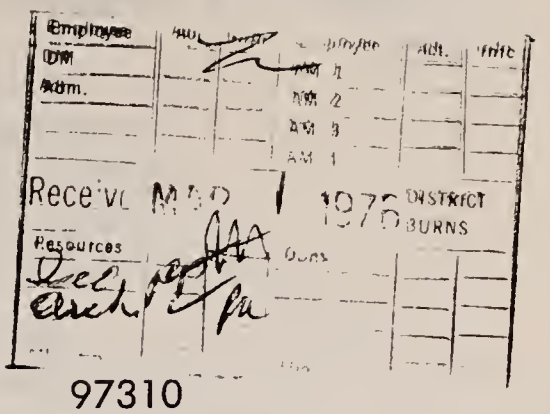
cc: Vivian Pollock, Juniper Ranch, Princeton, Or
Mary Kueny, 88 Bellevue, Winnemucca, NV

11-0

# OREGON STATE HIGHWAY DIVISION

HIGHWAY BUILDING • SALEM, OREGON • 97310

ROBERT W. STRAUB
GOVERNOR




February 26, 1976

Mr. L. Christian Vosler
District Manager
Bureau of Land Management
74 S. Alvord Street
Burns, Oregon 97720

Dear Mr. Vosler:

This letter is in regards to No. 3100 dated February 23, 1976, regarding an Environmental Analysis Record for two areas within your jurisdiction.

First, let me address myself to archeological sites. There are no complete surveys of the large areas involved. Partial surveys in and near the areas indicate a probable density of some three or four archeological sites per square mile. There are important quarry sites known in Sections 18 and 19 of T24S and R27E. A cave site explored by Mr. David Chance in Sec. 31 of T24S R28E was reported to the BLM in 1969. In the same year, Mr. Chance reported another site in Sec. 36 of T28S R36E. Last year, Prof. David Cole of the Oregon Museum of Natural History in Eugene located a large number of sites around the dry lakes in the area south of the highway. In addition, the area of Folly Farm is rich in petroglyphs. It would be advisable to identify as narrowly as possible areas of potential ground-disturbing activity and then have them surveyed by a professional archeologist. Keep in mind, however, that in rich areas such as these, as much as five days could be required to adequately survey one square mile.

A check of the National Register and the Statewide Inventory shows no sites within the survey area on either list. Due to the lack of Historical surveys, however, it would be advisable to have an historian conduct a survey. I am enclosing a list of recommended historians who would be able to carry out such a survey.

If our office can be of any further assistance to you, please feel free to contact us.

Sincerely,

Edward T. Long

Edward T. Long
Historic Preservation Archeologist
State Historic Preservation Office

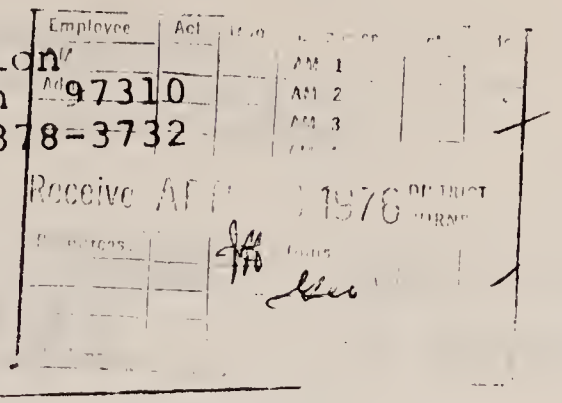
EL:ko

Enc.

# OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

## STATE CLEARINGHOUSE

Intergovernmental Relations Division
240 Cottage Street S.E., Salem, Oregon 97310
Leslie Lehmann, Coordinator Ph: 378-3732




## STATE A-95 REVIEW CONCLUSIONS

APPLICANT: Bureau of Land Management

PROJECT TITLE: Preparation of Environmental Analysis for Oil and Gas Leasing

DATE: 4/6/76

The state has reviewed your project and reached the following conclusions:

[X] No significant conflict with the plans, policies or programs of state government have been identified ~~and your proposal is endorsed as presented~~.

[X] Relevant comments of state agencies are attached and should be considered in the final design of your proposal.

[ ] Potential conflicts with the plans and programs of the state agency(s) have been satisfactorily resolved. No significant issues remain.

[ ] Significant conflicts with the plans, policies or programs of state government have been identified and remain unresolved. The final proposal has been reviewed and the final comments and recommendations of the state are attached.

### NOTICE TO FEDERAL AGENCY

The following is the officially assigned State Identifier Number:

7603-5-610

This number should be used on all correspondence and particularly on SF 240 as required by OMB A-98.

# OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

## STATE CLEARINGHOUSE

Intergovernmental Relations Division
240 Cottage Street S.E., Salem, Oregon 97310
Leslie Lehmann, Coordinator Phone: 378-3732

RECEIVED-PTLD
MAR 17 1976
DEPT OF GEOLOGY
MAR 23 1976

PNRS STATE REVIEW

Project #: 7603 5 610 Due Date: APR 02 1976

To Agency Addressed: If you intend to comment but cannot respond by the return date, please notify us immediately. If no response is received by the due date, it will be assumed that you have no comment and the file will be closed.

---

PROGRAM REVIEW AND COMMENT

To State Clearinghouse: We have reviewed the subject Notice and have reached the following conclusions on its relationship to our plans and programs:

( ) It has no adverse effect.

( ) We have no comment.

(X) Effects, although measurable, would be acceptable.

( ) It has adverse effects.

( ) We are interested but require more information to evaluate the proposal.

( ) Please coordinate the implementation of the proposal with us.

( ) Additional comments for project improvement. (Attach if necessary)

- - - - - - - - - - -

REMARKS (Please type or print legibly)

A report covering prospects for oil and gas production, describing general geology, and discussing the probable impact of exploration and development on the area was submitted to the USBLM district office.

H-12

Agency Geology By Vernon C Newton Jr

# DEPARTMENT OF ENERGY

LOCAL GOVERNMENT RELATIONS DIV.
MAR 22 1976

528 COTTAGE STREET N.E. • SALEM, OREGON • 97310 • Phone 378-6469

ROBERT W. STRAUB
GOVERNOR

LON TOPAZ
Director

March 19, 1976

L. Christian Vosler
District Manager
U.S. Department of the Interior
Bureau of Land Management
Burns District Office
74 S. Alvord
Burns, Oregon 97720

Dear Mr. Vosler: Ref: 7603 5 610

The Department of Energy has received notification of your intent to prepare an environmental analysis of areas within your jurisdiction for oil and gas leasing.

The items to be reviewed, as identified in your notice, are those generally discussed in EAR's and EIS's. At this time, we do not have any comment toward additional items to be considered but request the opportunity to review the draft EAR when available.

Sincerely,

W. R. Vermeere
Environmental Specialist

WRV:bh

# OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

## STATE CLEARINGHOUSE

Intergovernmental Relations Division
240 Cottage Street S.E., Salem, Oregon 97310
Leslie Lehmann, Coordinator Phone: 378-3732

PNRS STATE REVIEW

Project #: 7603 5 610 Due Date: APR 02 1976

To Agency Addressed: If you intend to comment but cannot respond by the return date, please notify us immediately. If no response is received by the due date, it will be assumed that you have no comment and the file will be closed.

---

PROGRAM REVIEW AND COMMENT

To State Clearinghouse: We have reviewed the subject Notice and have reached the following conclusions on its relationship to our plans and programs:

( ) It has no adverse effect.

( ) We have no comment.

( ) Effects, although measurable, would be acceptable.

( ) It has adverse effects.

( ) We are interested but require more information to evaluate the proposal.

(X) Please coordinate the implementation of the proposal with us.

( ) Additional comments for project improvement. (Attach if necessary)

- - - - - - - - - -

REMARKS (Please type or print legibly)

RECEIVED
MAR 17 1976
DEPT. OF ENERGY

H-14

Agency Energy Dept By

# DIVISION OF STATE LANDS

1445 STATE STREET • SALEM, OREGON • 97310 • Phone 378-3805

OREGON STATE
LAND BOARD

ROBERT W. STRAUB
Governor

CLAY MYERS
Secretary of State

JAMES A. REDDEN
State Treasurer

WILLIAM S. COX
Director

April 2, 1976

Burns District Office
Bureau of Land Management
74 S. Alvord St.
Burns, OR 97720

Gentlemen:

This letter is in response to your letter of March 8, 1976 concerning the preparation of an environmental analysis of the effects of oil and gas leasing and possible development in a specified area southeast of Burns.

In 1971, an oil, gas and sulphur lease was issued for State Land Board lands including those lying within and adjacent to the area being studied. The lease carries a primary term of ten years and was issued to Standard Oil of California.

Sincerely,

Kenneth R. Doud

Kenneth R. Doud
Appraiser

vw

# OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

## STATE CLEARINGHOUSE

Intergovernmental Relations Division
240 Cottage Street S.E., Salem, Oregon 97310
Leslie Lehmann, Coordinator Phone: 378-3732

LOCAL GOVERNMENT RELATIONS DIV
APR 5 1976

PNRS STATE REVIEW

Project #: 7603 5 610 Due Date: APR 02 1976

To Agency Addressed: If you intend to comment but cannot respond by the return date, please notify us immediately. If no response is received by the due date, it will be assumed that you have no comment and the file will be closed.

---

PROGRAM REVIEW AND COMMENT

To State Clearinghouse: We have reviewed the subject Notice and have reached the following conclusions on its relationship to our plans and programs:

( ) It has no adverse effect.

( ) We have no comment.

( ) Effects, although measurable, would be acceptable.

( ) It has adverse effects.

( ) We are interested but require more information to evaluate the proposal.

(X) Please coordinate the implementation of the proposal with us.

( ) Additional comments for project improvement. (Attach if necessary)

- - - - - - - - - - -

REMARKS (Please type or print legibly)

(See Attached Comments)

H-16

Agency Fish & Wildlife By Norman Behrns
ENVIRONMENTAL MANAGEMENT SECTION 4-1-76

OREGON DEPARTMENT OF FISH AND WILDLIFE

comments on

Bureau of Land Management - Burns District
Oil and Gas Leasing (Project No. 7603-5-610)

April 1, 1976

The Department has reviewed the potential impacts to fish and wildlife and have no objection provided the land management agency and the leasee include, but not limited to, the following protective measures as conditions of the lease.

1. Temporary roads used during expioration and development be closed following work completion. This would best be accomplished by ripping the road and seeding with appropriate grass, forb, and/or shrub and tree species.

2. Any water source developed in conjunction with exploratory or development activities should be evaluated in terms of benefitting wildlife and livestock.

3. No work be permitted prior to July 1 of any year to avoid conflict with deer fawning, antelope kidding, and bird nesting. Timing restrictions may vary for specific work locations.

4. No work or camps be allowed within at least one-half mile of antelope watering areas. Other valuable wildlife watering areas should be excluded as campsites and protected from prolonged work activities.

5. Sagegrouse concentration areas such as strutting grounds and wintering grounds be protected by a buffer zone. Size of buffer zone to be coordinated by mutual discussion and site inspection.

The degree of impact on fish and wildlife will depend on various factors including, but not limited to, location and magnitude of production facilities, water use, transmission facilities required, and possible secondary industrial and residential development.

Enclosure

cc Fish and Wildlife Service, Sherry Horton
Bill Hosford
E. Mason
Vic Masson
Al Polenz

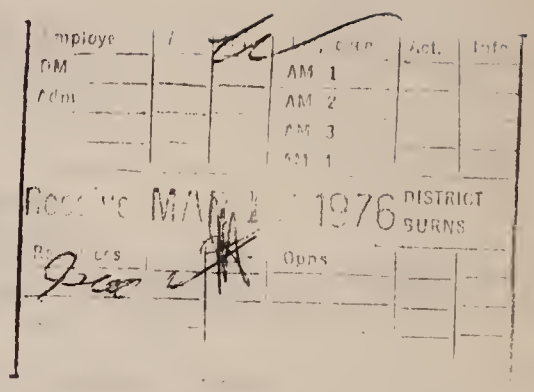
# United States Department of the Interior

BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043-550 WEST FORT STREET
BOISE, IDAHO 83724

IN REPLY
REFER TO: 160

120.1

MAR 17 1976




Memorandum

To: District Manager, Bureau of Land Management, USDI, Burns, Oregon

From: Acting Regional Environmental Officer, Boise, Idaho

Subject: Effects of Oil and Gas Leasing and Possible Development on Area Shown on BLM Map (Your March 8, 1976 Invitation to Participate)

The subject map has been reviewed by appropriate members of the staff of the Regional Office and we have no comments to provide you at this time. Thank you for giving us the opportunity to review this area map.

Douglas J. James

BLM Library
Denver Federal Center
Bldg. 50, OC-521
P.O. Box 25047
Denver, CO 80225